CNC mdl

Engraver ver. 01a

GUIDE

Drawing and CAD conversion file in XYZ
Preparation of G-Code file

In order to use the machine tools is essential the employ of the personal protective equipment and is important to pay close attention and vigilance.

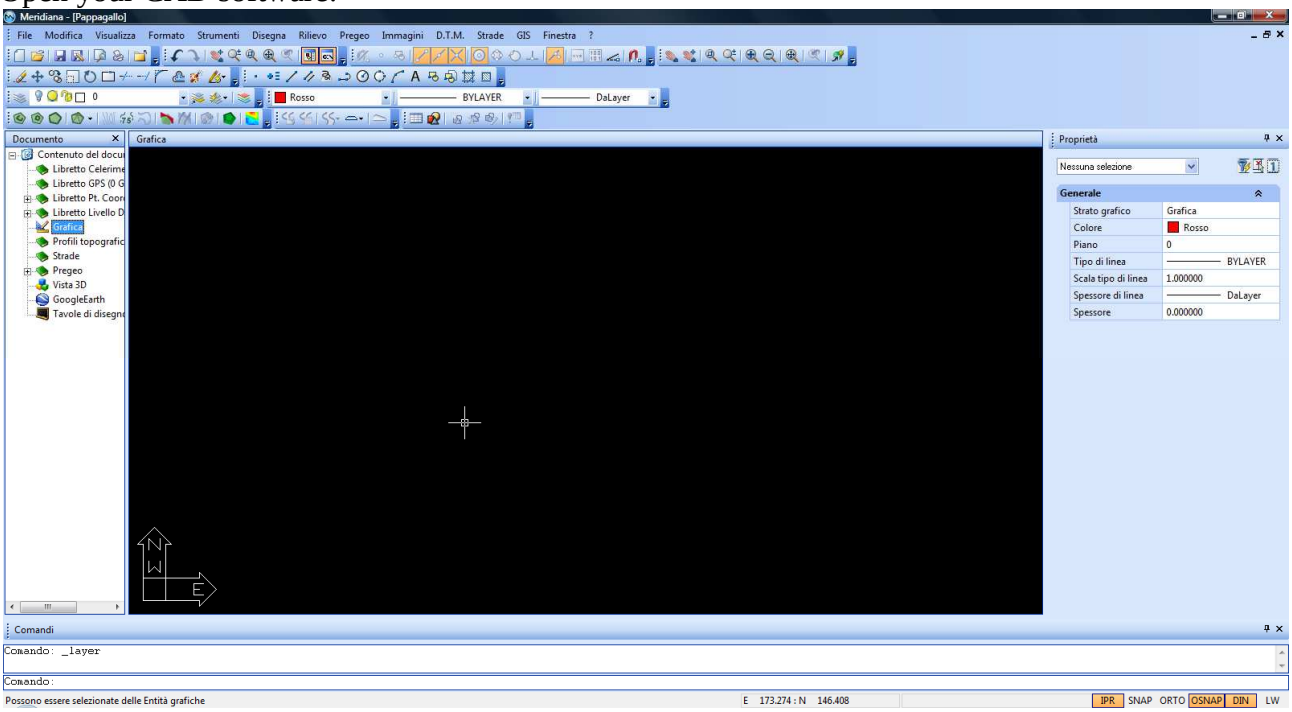
CAD Drawing

The CNC mdl – Engraver software is able to recover the data of a drawing to engrave made with any CAD software that can generate a .DXF file and automatically create the related G-Code.
The software does not consider arcs or circles.
To facilitate the design, you can use a graphics tablet. From this, superimposing any drawing, it is easy to trace the polylines going over the edges of our base picture.

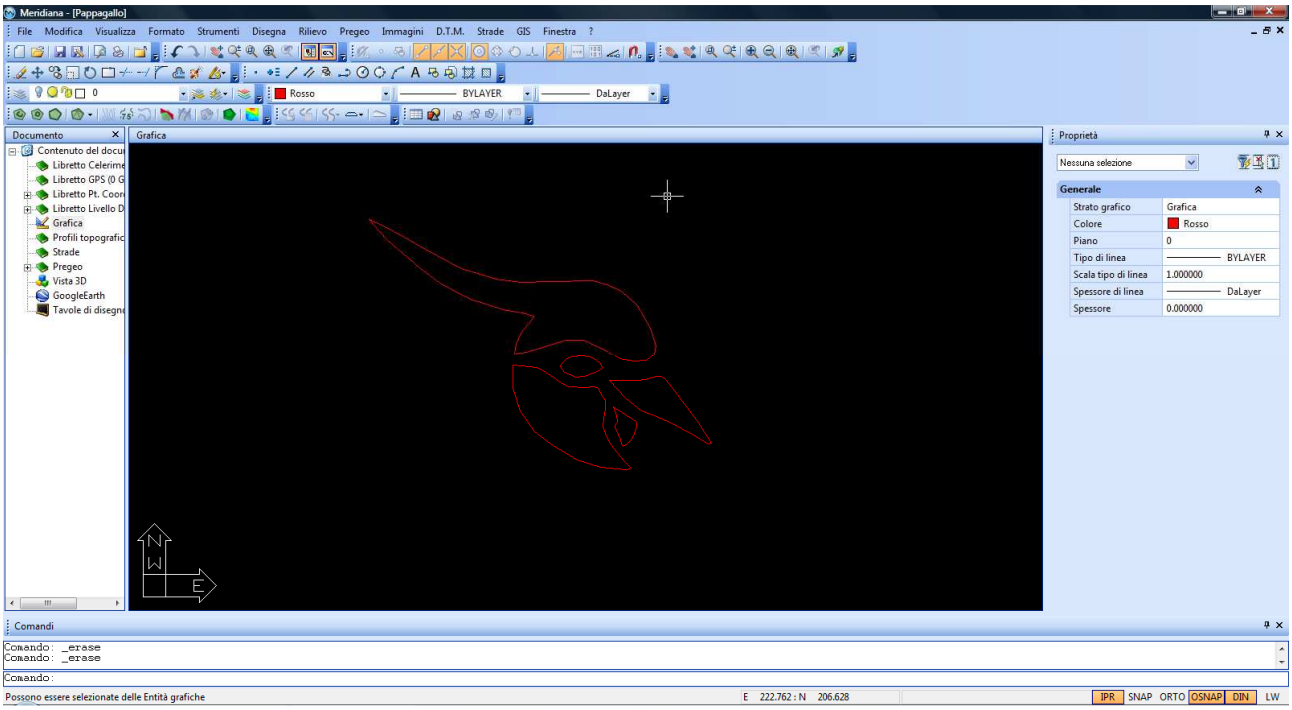
Design realization:

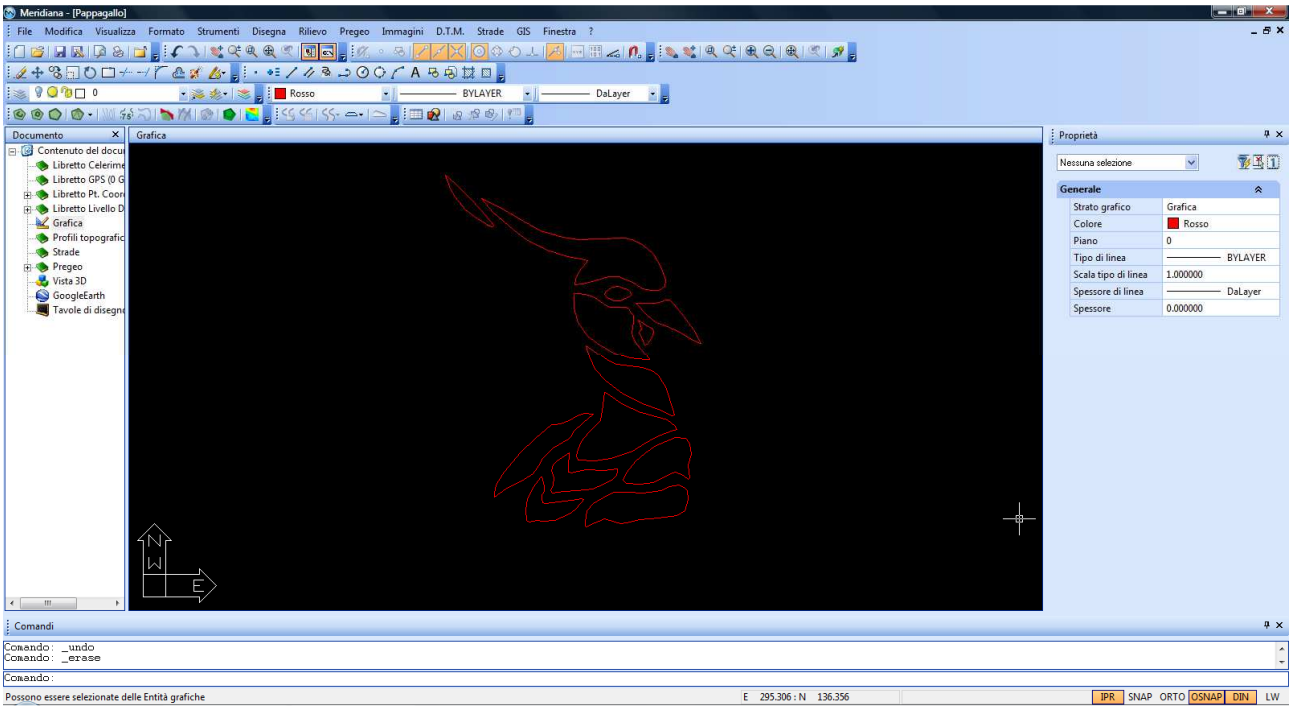
Have pity on my artistic style but I'm not a designer.

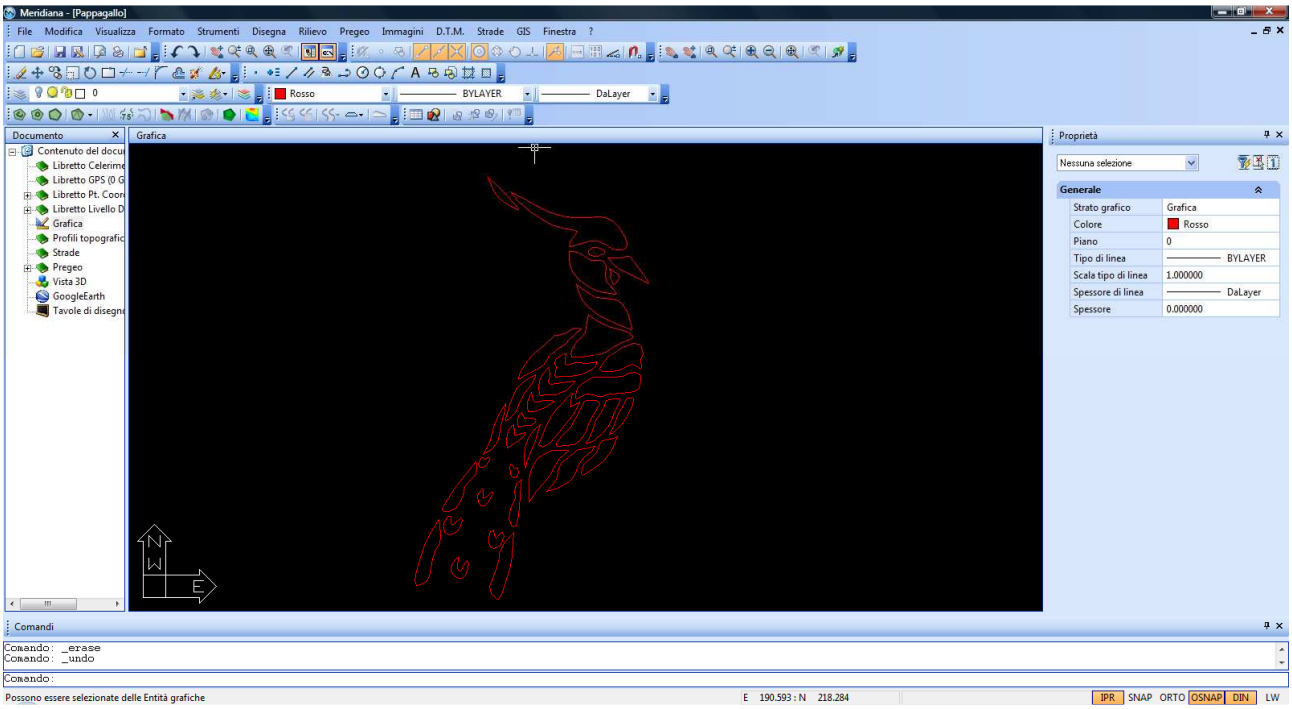
Open your CAD software:

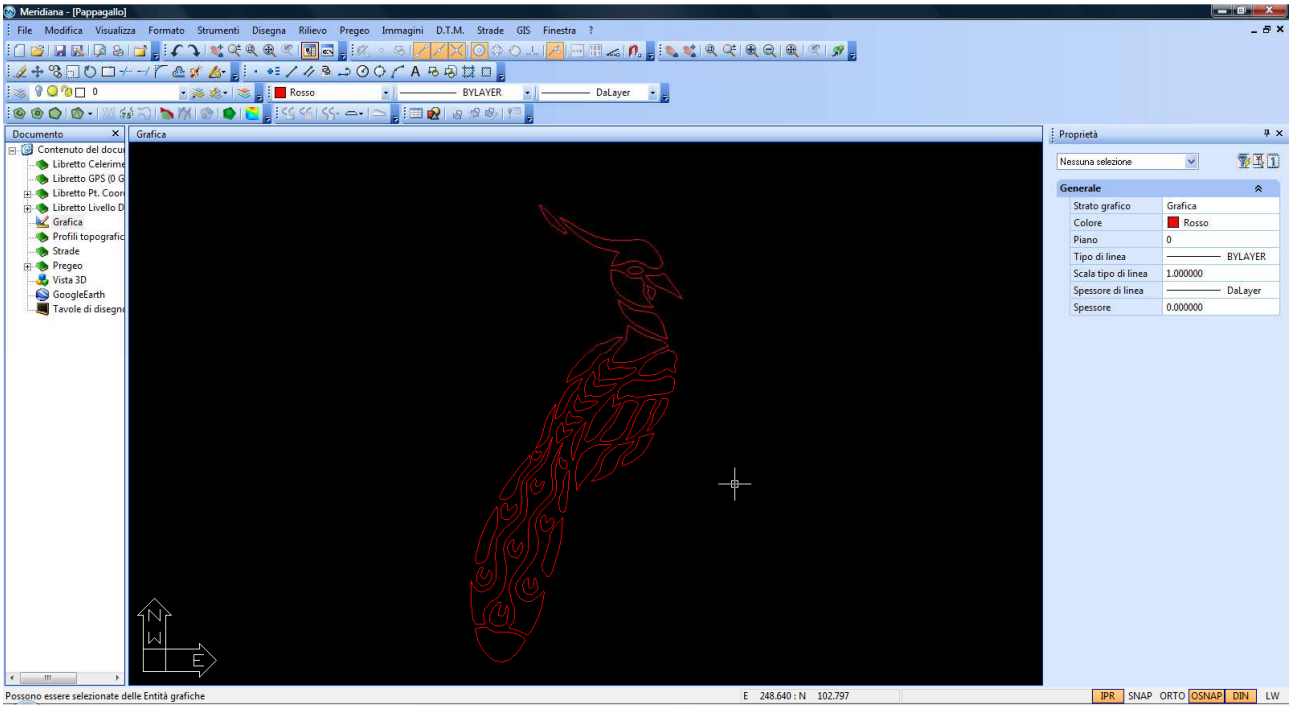


Start drawing with the polylines:





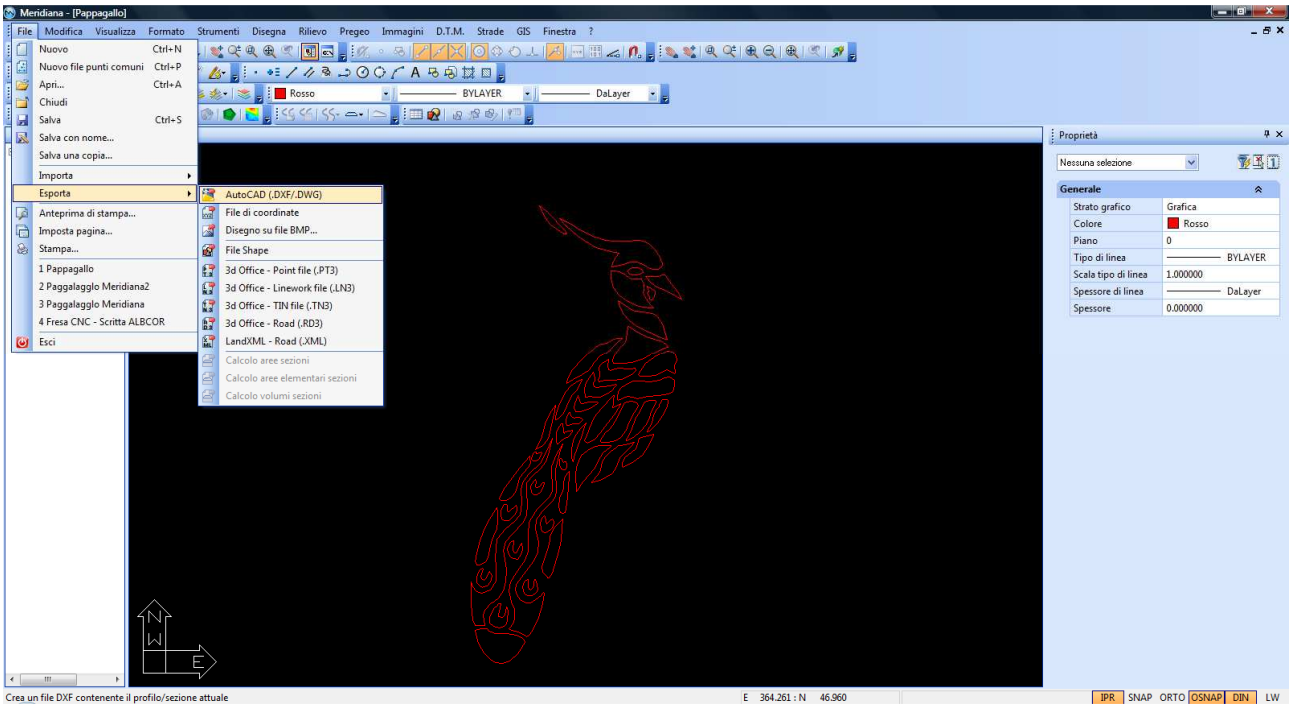


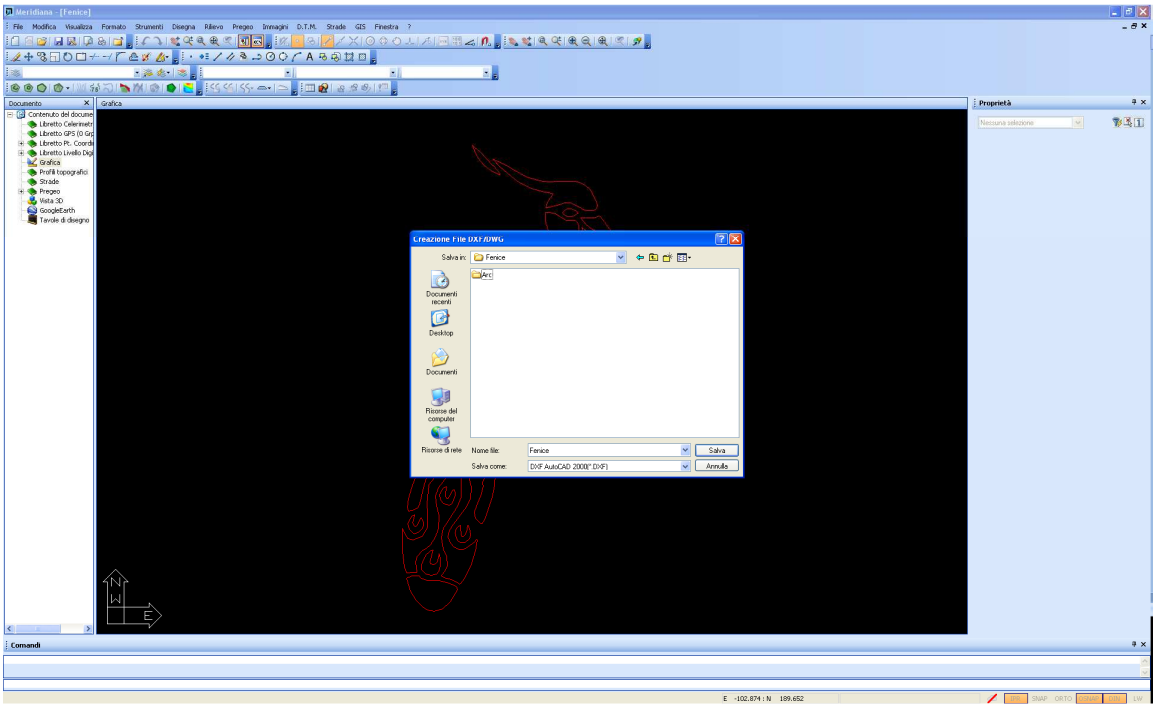


We finished our drawing.

CAD Drawing – Saving DXF file

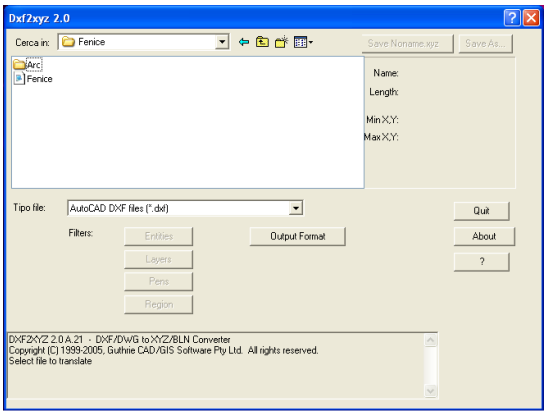
Now we proceed saving the drawing in .DXF format.





CAD Drawing – Conversion file from DXF to XYZ

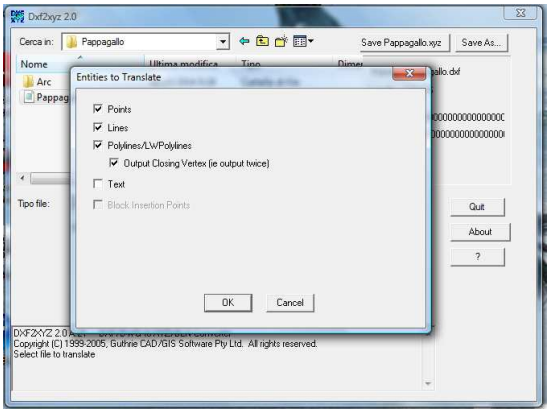
Now we proceed to the conversion of the .DXF file to the format .XYZ.
For this purpose use the “DXF2XYZ” software which is freely to download from the website.



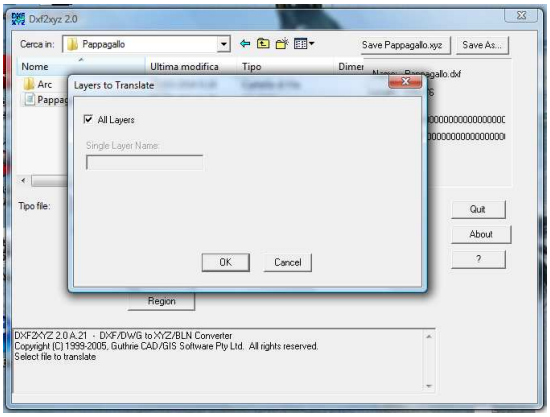
At our first work, we go to set the conversion parameters (then they will remain stored).

Now set the software as the pictures below (or, for the more experienced, according to your needs):

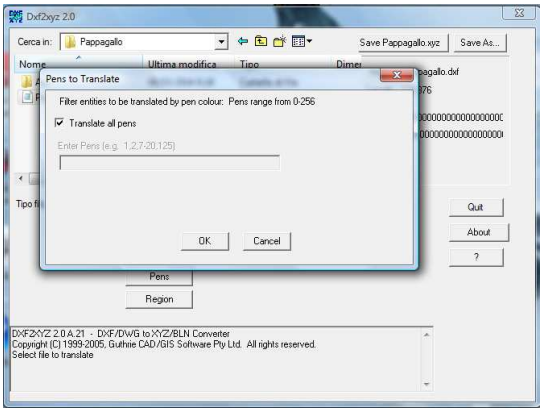
Filters - Entities:



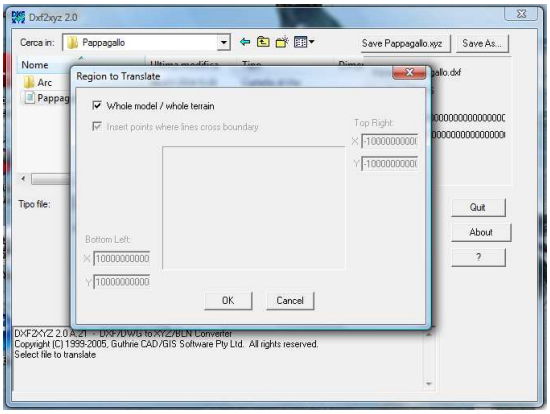
Filters - Layers:



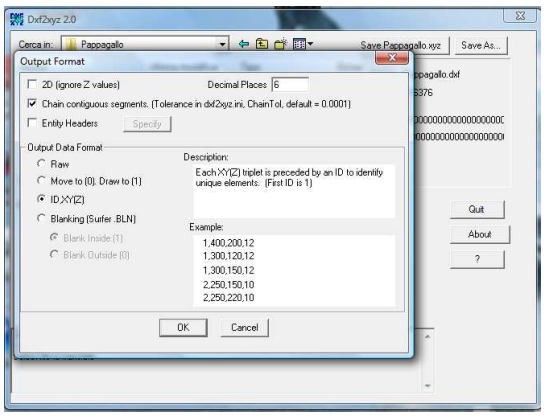
Filters - Pens:



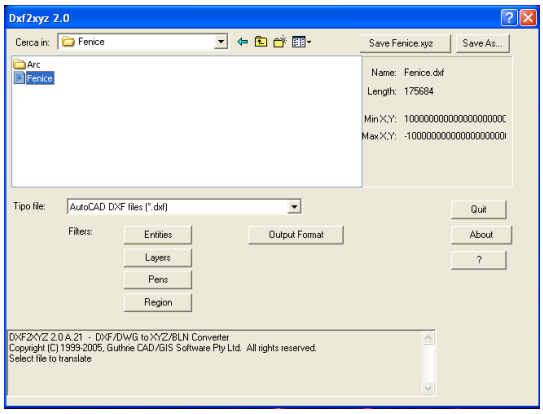
Filters - Region:

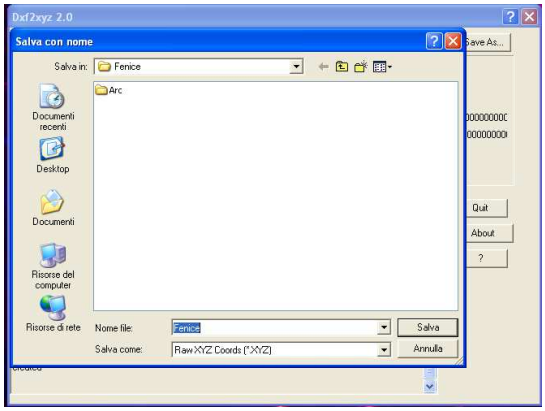


Set now the parameters for the “Output Format” of the .XYZ file:



Upload your file in .DXF format and proceed saving in .XYZ format by clicking on the “Save” button.





We can save the file directly in the “File XYZ” folder, choosing “browse folders”, or by subsequently copying from the save folder.

We generated the file of our work in .XYZ format.

Now, if we open our file “phoenix.xyz” with a text editor, we will find these data:

In the .XYZ file we can see the following:

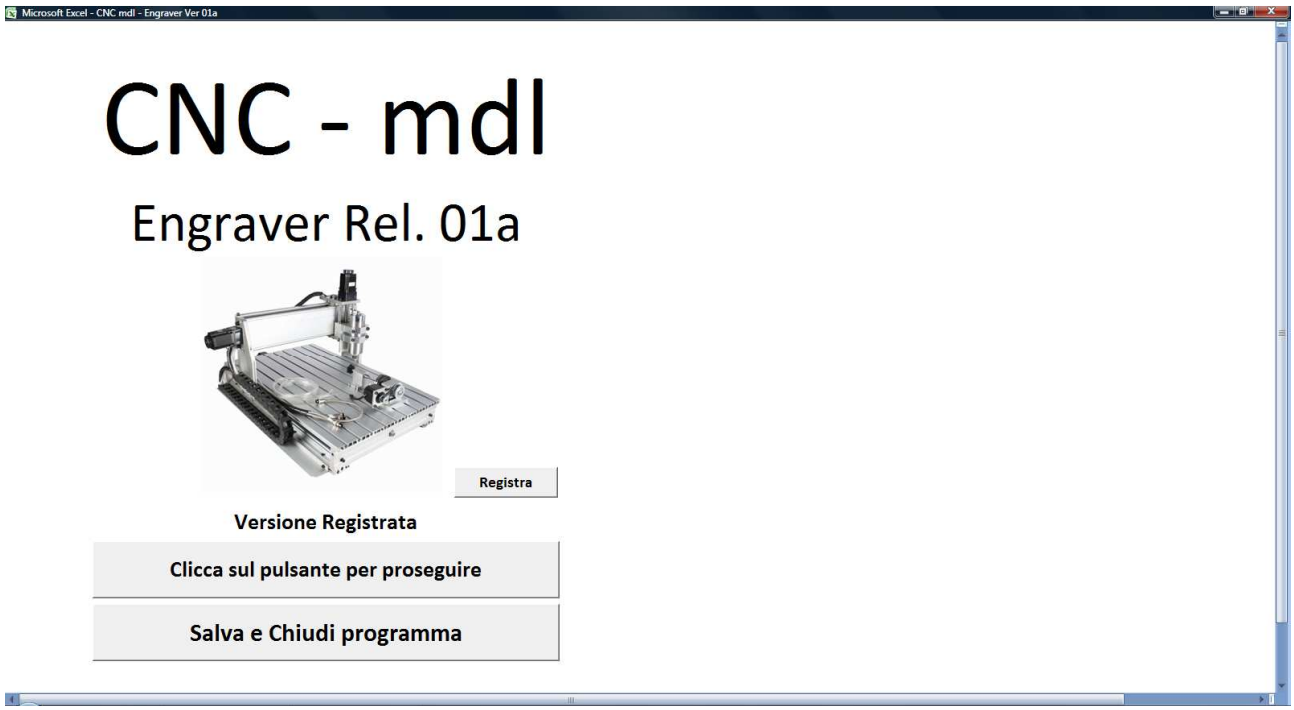
tabulations:	the tabulations are constituted by a ",";
first tabulation:	number of polylines; this is automatically generated (at each change of numeration, the incision stops and the subsequent begins);
second tabulation:	coordinated "X"
third tabulation:	coordinated "Y"
fourth tabulation:	coordinated "Z"

NOTE:
The coordinated "Z" is automatically managed and generated by the CNC mdl – Engraver Software.

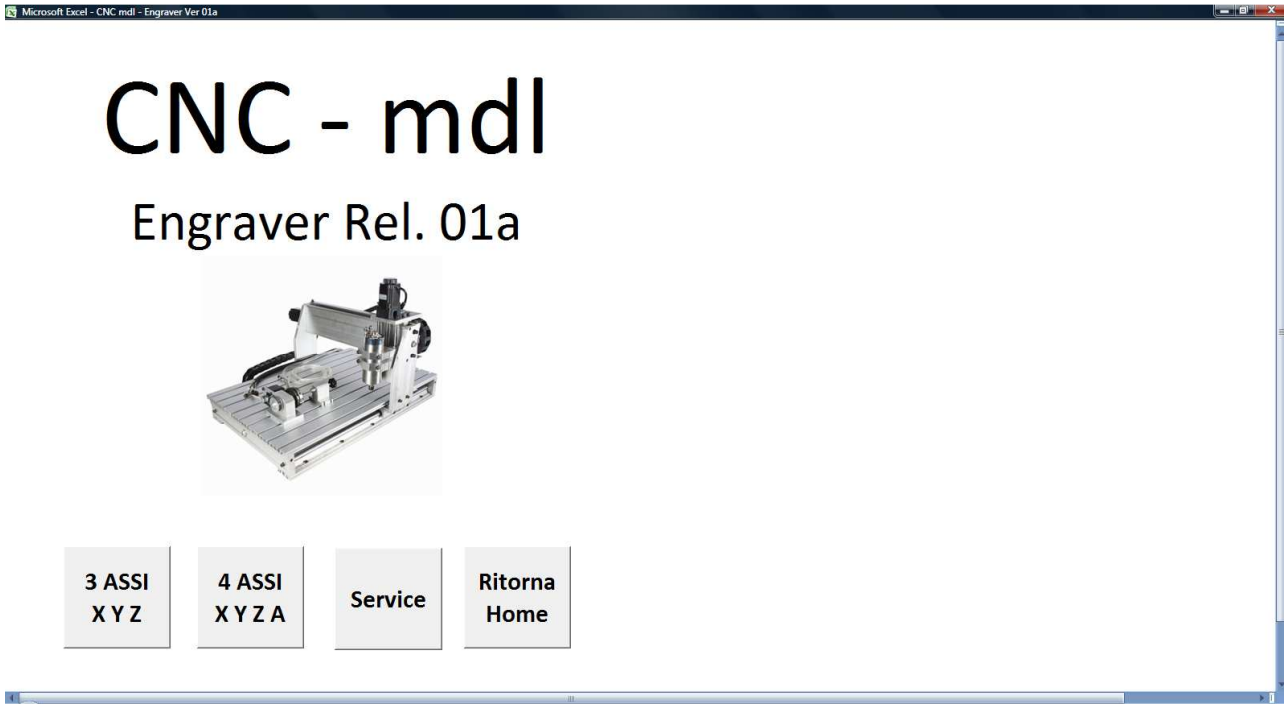
To recover the data by the CNC mdl – Engraver Ver. 01a software it is necessary that the file is stored in the folder:
"CNC mdl - Engraver Ver. 01a\ File XYZ"

Preparation of the G-Code file

Open the software CNC mdl - Engraver



Click on the “continue” button



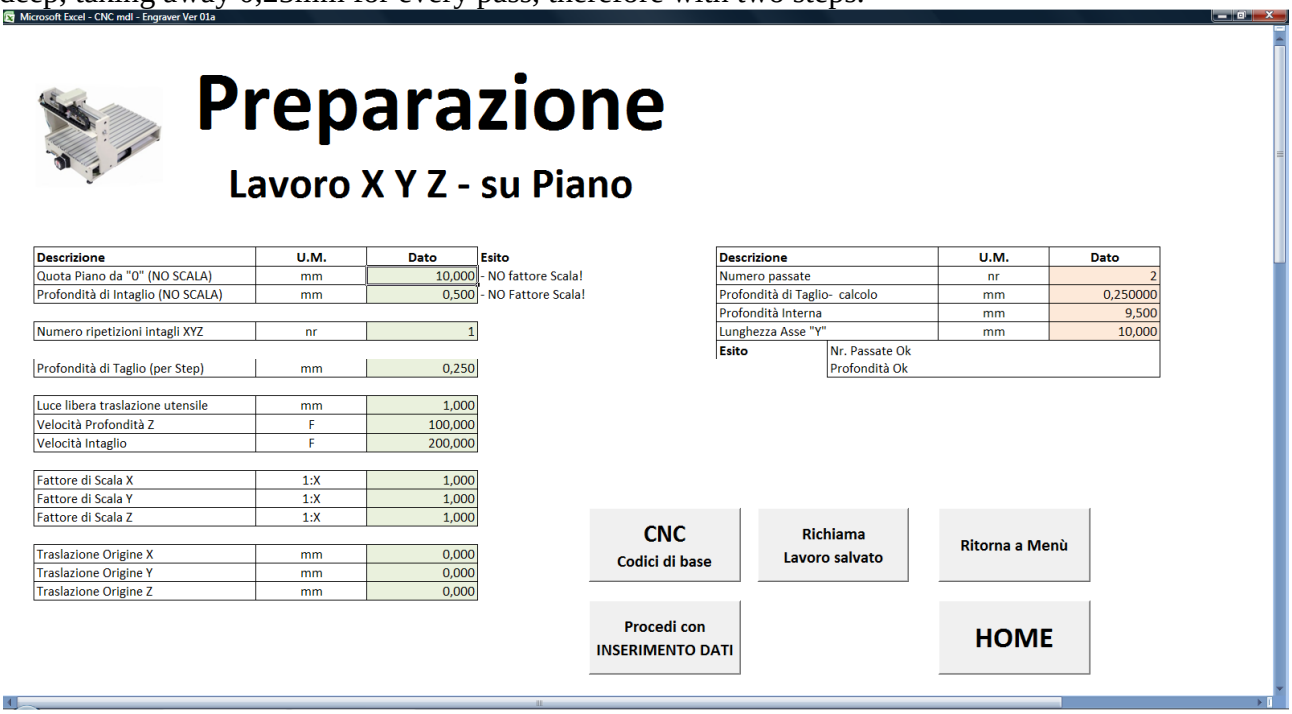
Now we have two choices:

1. incision on a plane surface (3 axes – XYZ);
2. incision on a cylindrical surface (4 axes – XYZA).

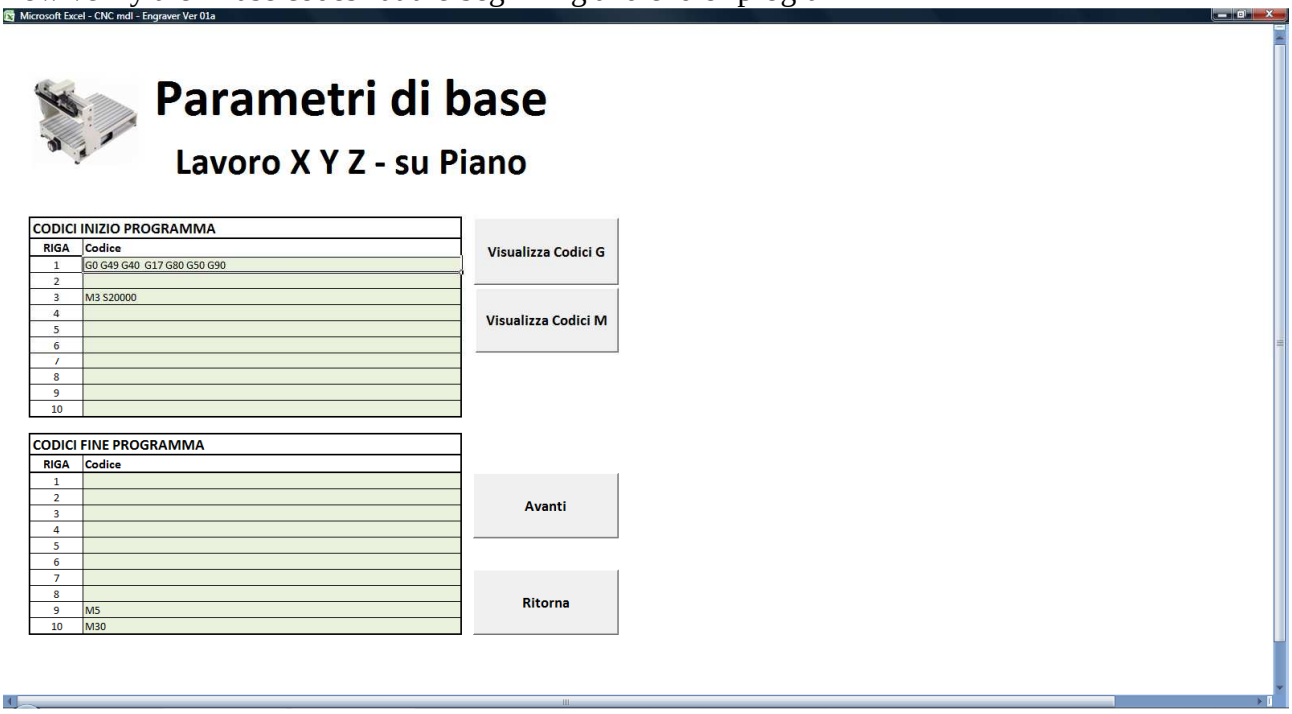
Preparation of the G-Code file – Plane incision (3 axes)

1) Incision on a plane surface.

Insert the base data and check them all carefully:
in this case we decided to use a tablet with a thickness of 10mm and to perform an incision 0,5mm deep, taking away 0,25mm for every pass, therefore with two steps.

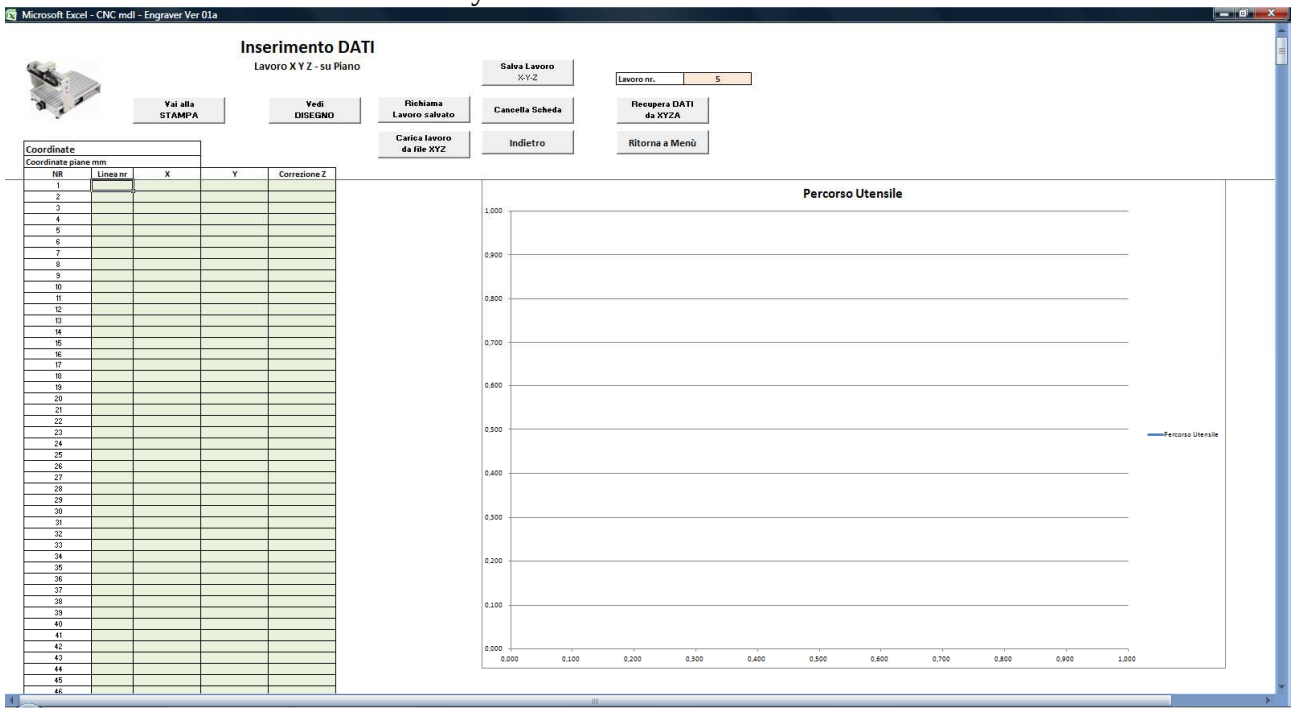


Now verify the “Base codes” at the beginning and end of program

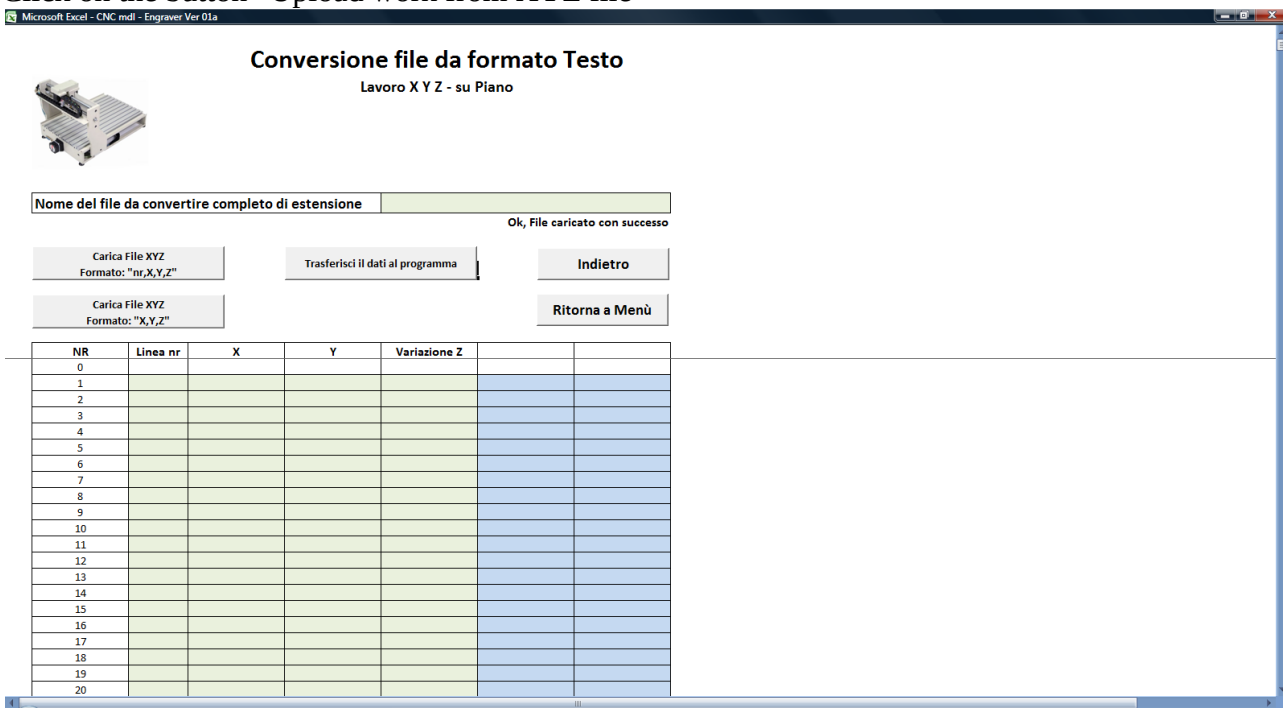


Done this let’s go ahead.

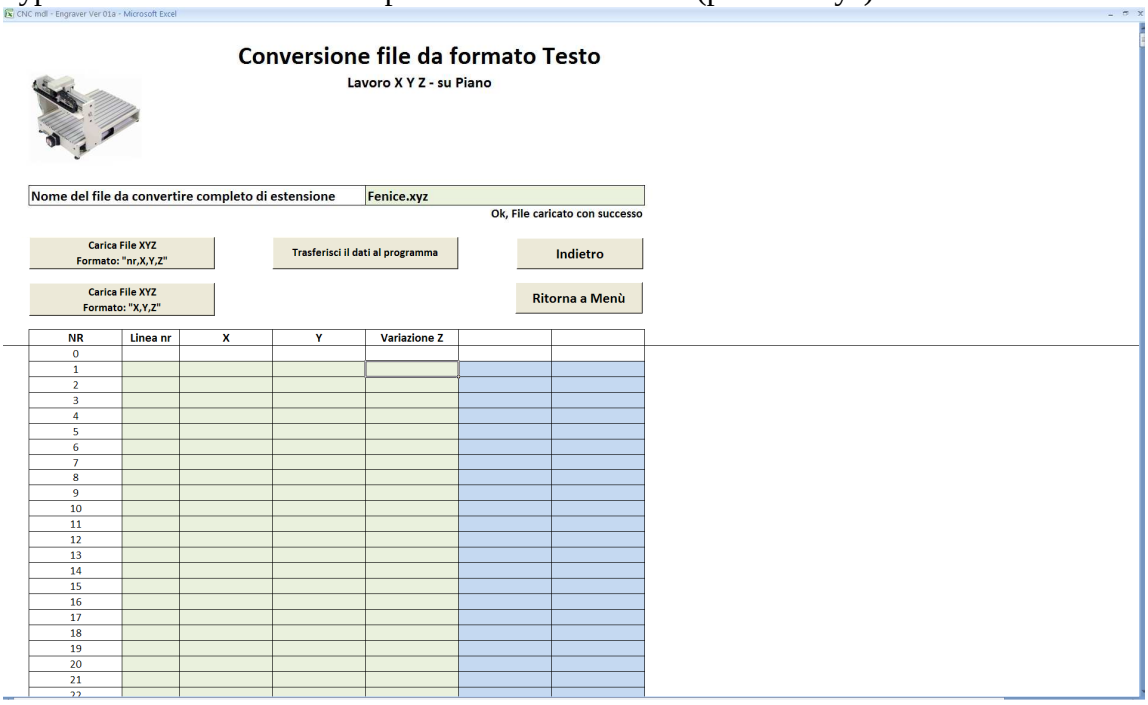
We are now in the screen “Data Entry”



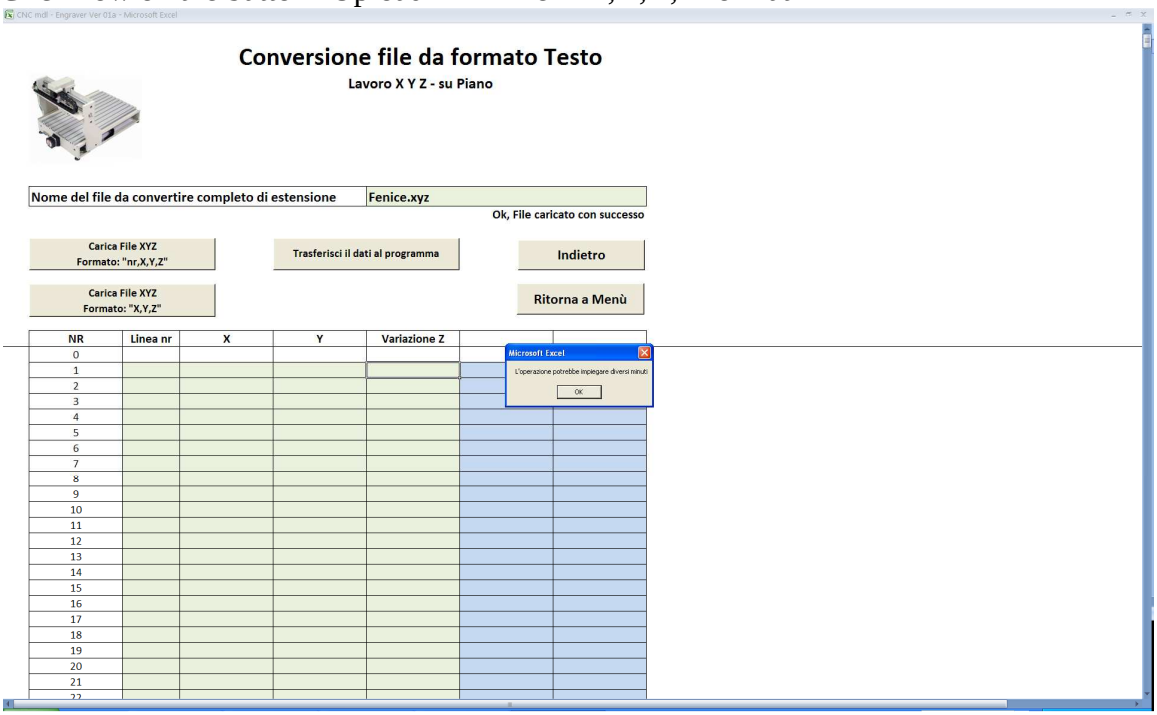
Click on the button “Upload work from XYZ file”



Type the name of the file complete with his extension (phoenix.xyz) and confirm with “enter”.



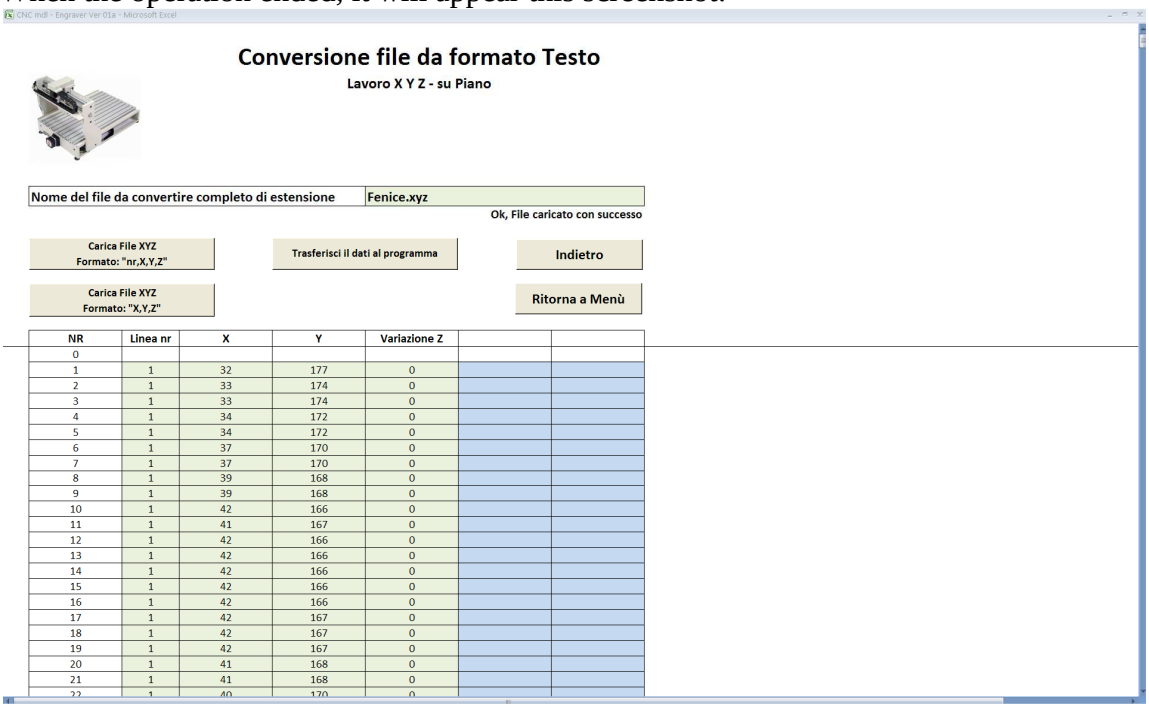
Click now on the button “Upload XYZ file – nr,X,Y,Z format”



Confirm.

The import screen will appear. Wait until the end of the process. The time needed is related to the drawing entity and your PC speed.

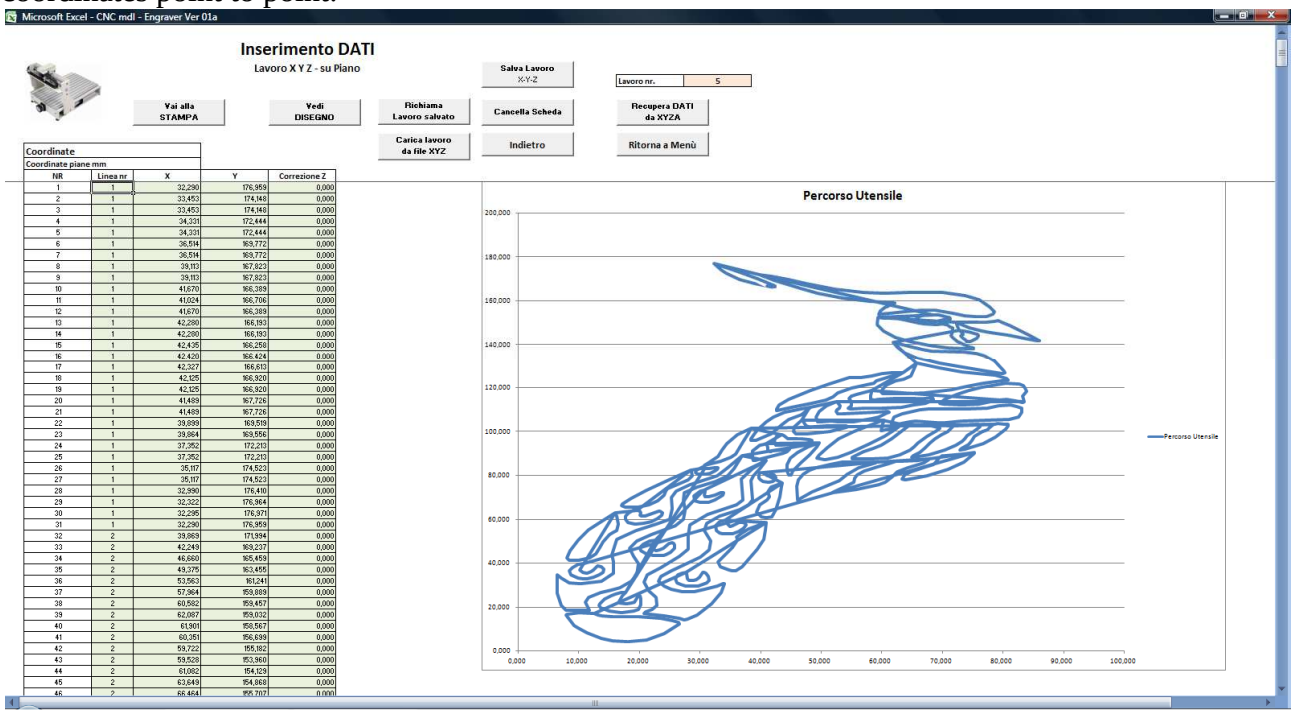
When the operation ended, it will appear this screenshot:



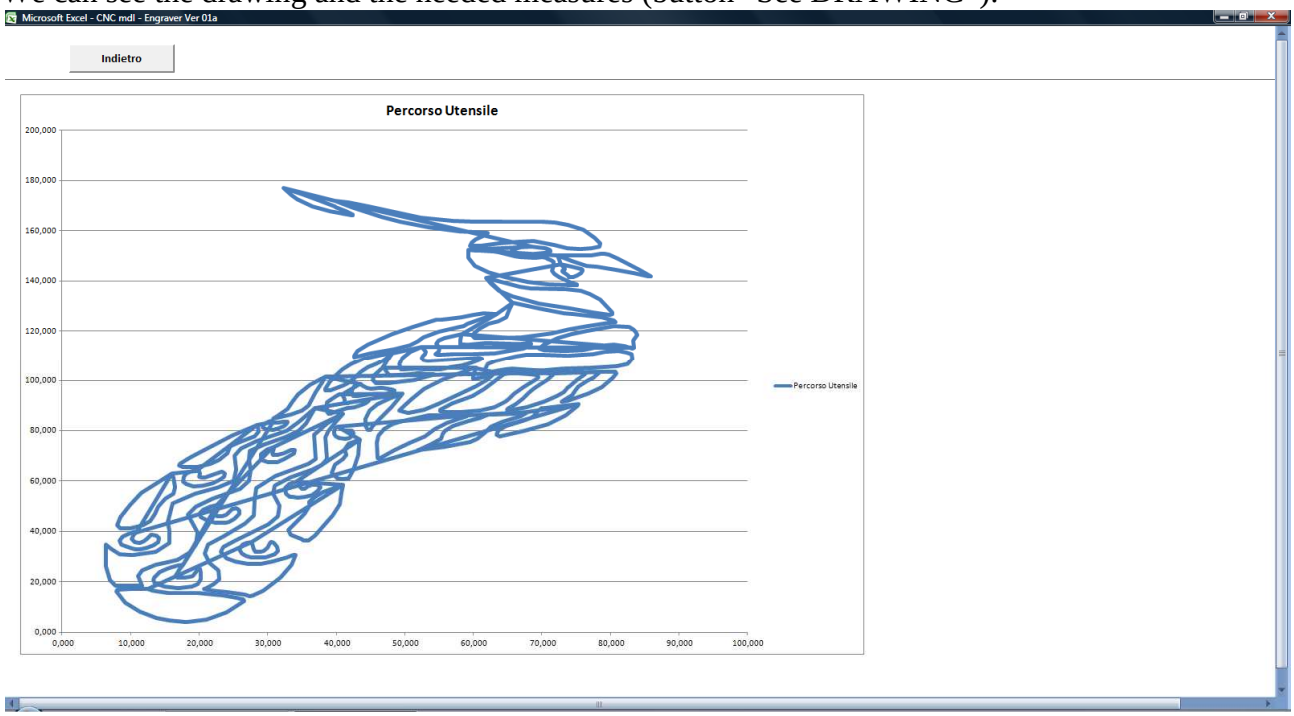
Click on “Transfer the data to the program”.

The drawing will be generated automatically.

In the columns to the left is the number of the polyline associated with incision and the related coordinates point to point:

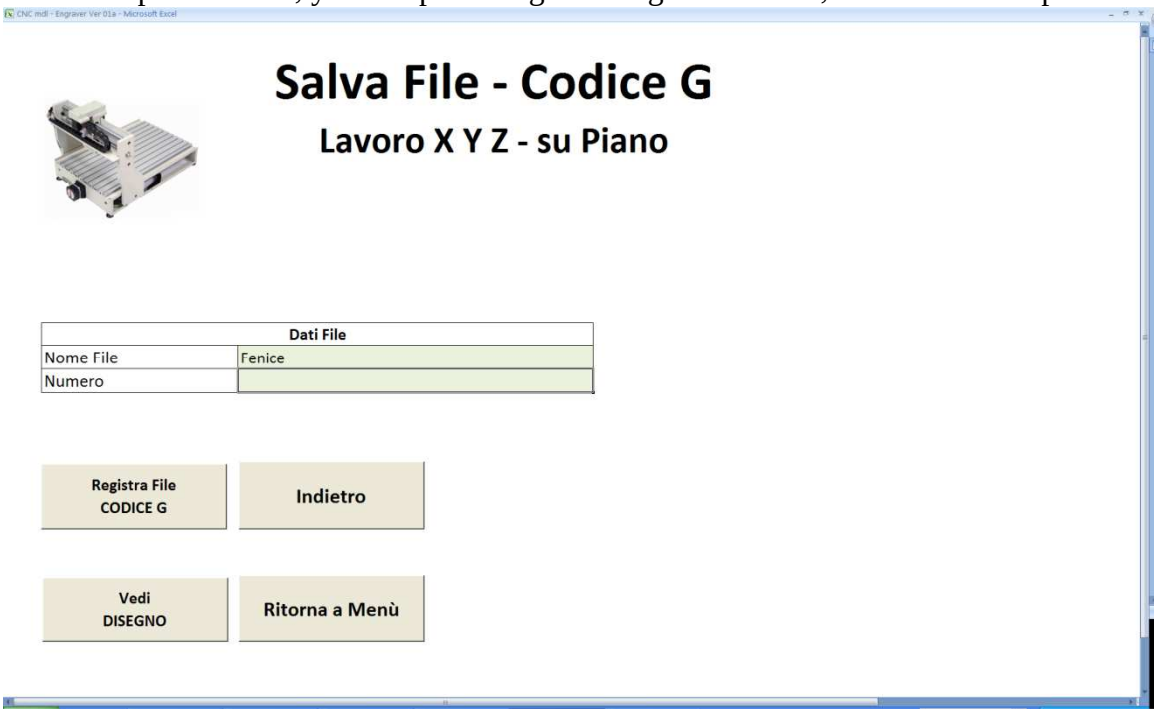


We can see the drawing and the needed measures (button “See DRAWING”):

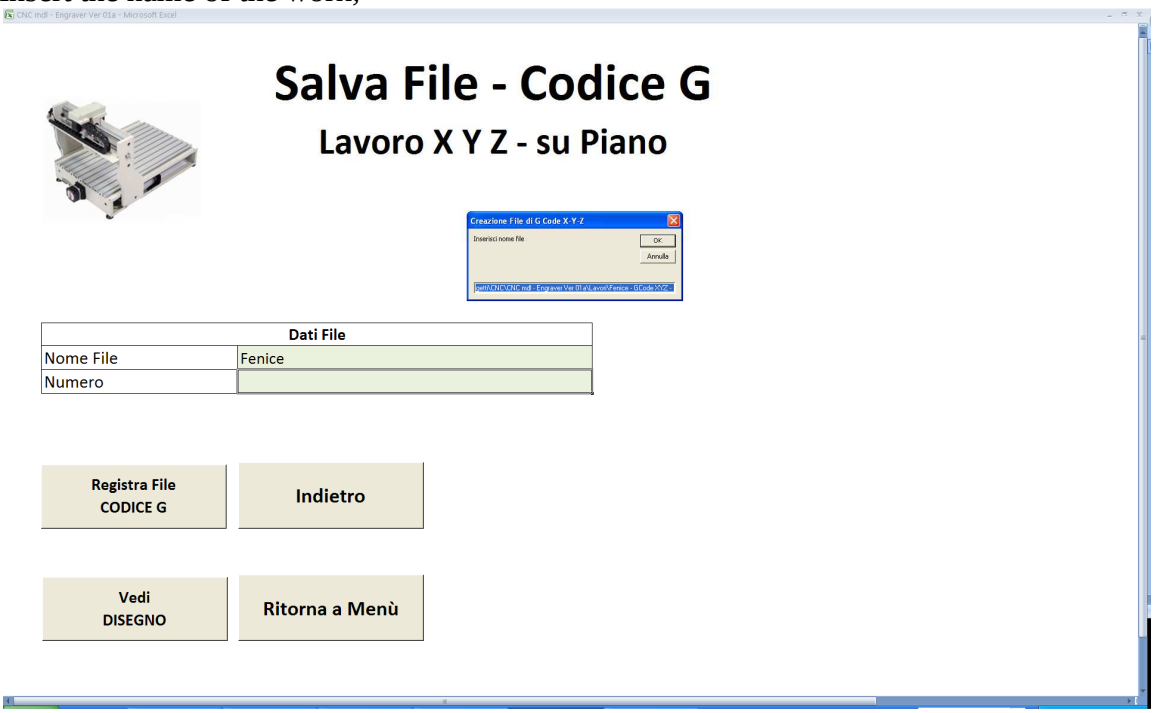


If it is needed to change measures, for example to engrave the “phoenix” on a smaller or bigger surface, it is not required a complicated remaking of the drawing or do complicated operations: you simply return to the specific menu and modify the various “Scale factor”.
Then you review the drawing and check the new measures.

When this phase ended, you can proceed generating the G-Code; click on “Go to print”:

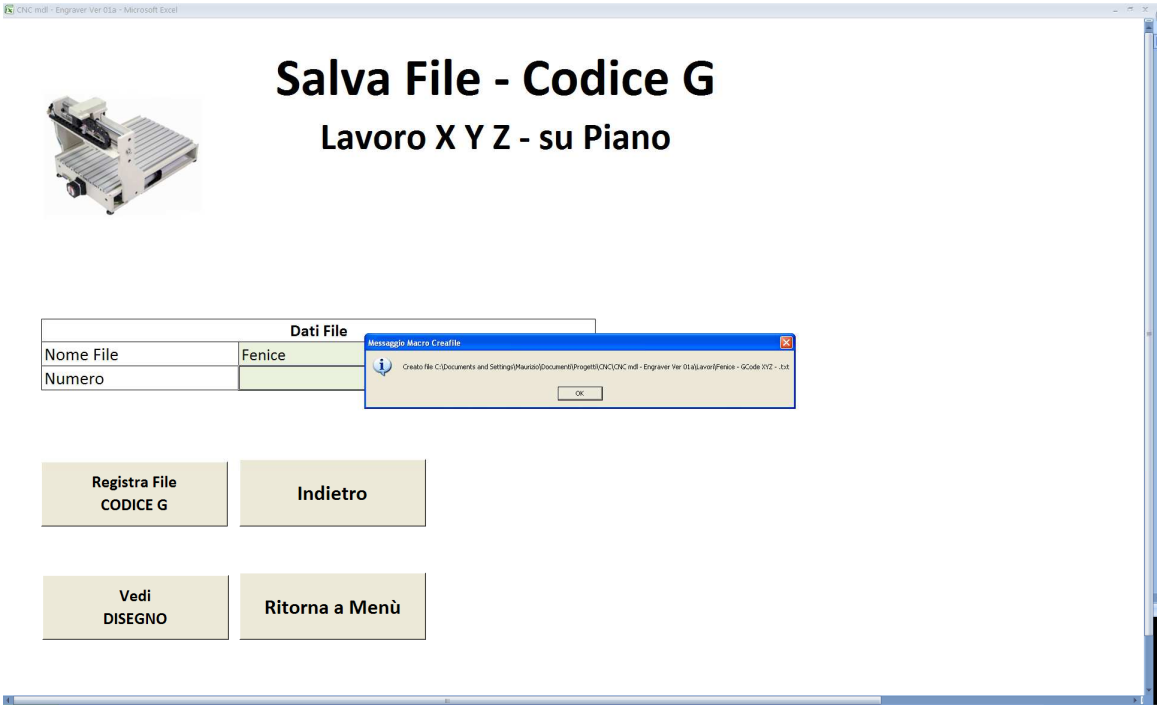


Insert the name of the work;



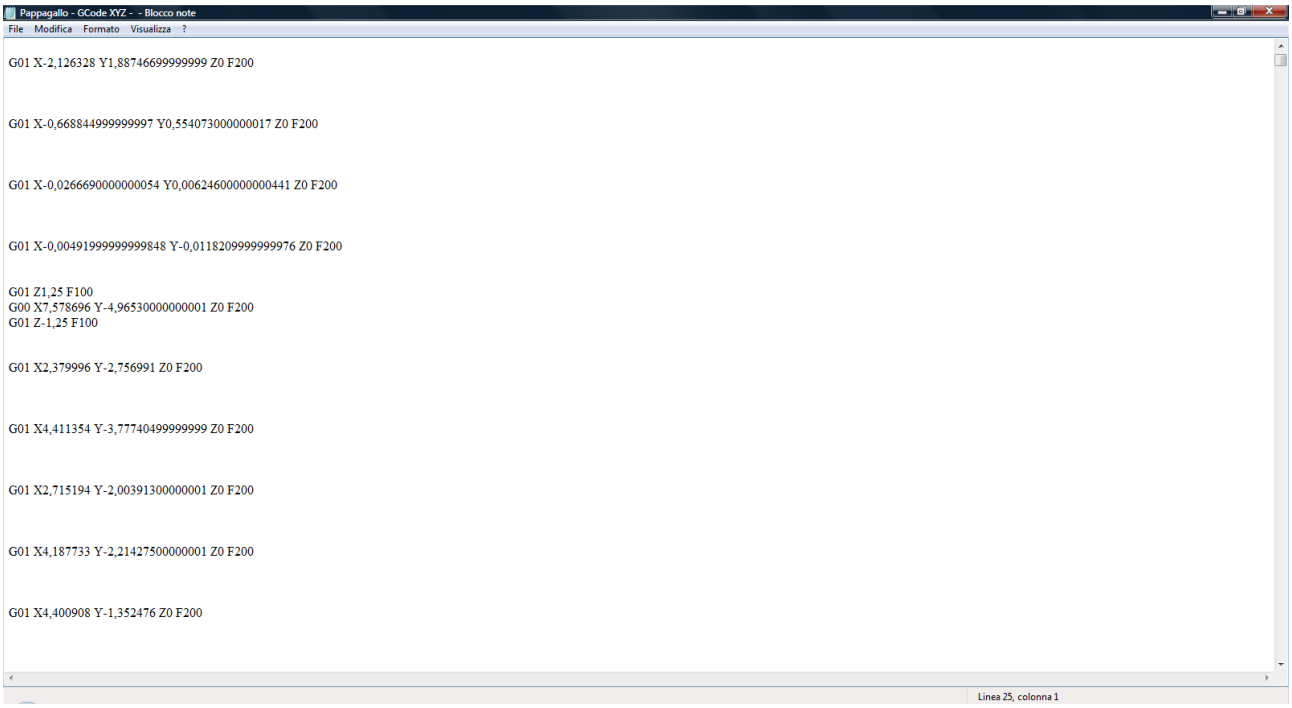
Click on the “Record the G-CODE file” button and confirm.

The screen confirms the creation of the file:



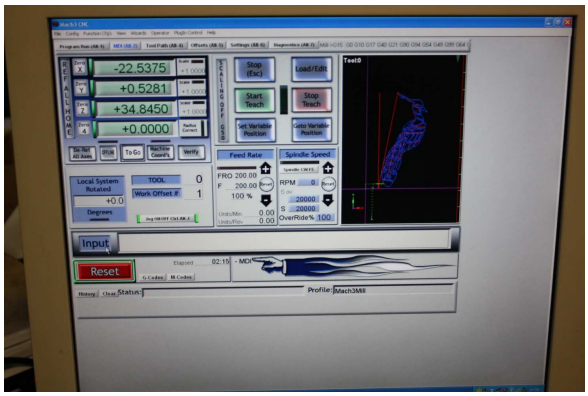
The G-Code file is ready and can be transferred to the CNC machine.

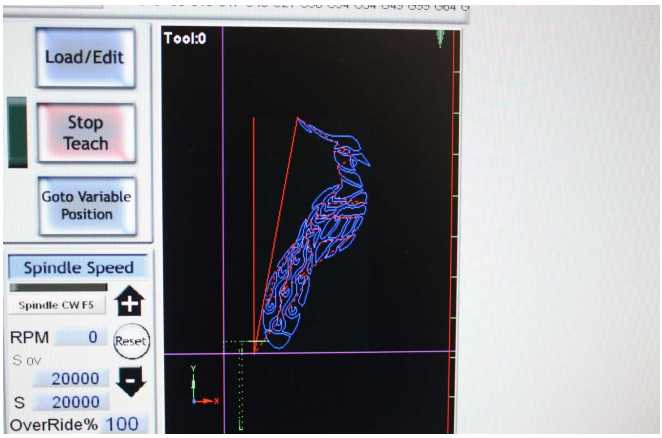
For more details let’s analyze the generated G-Code file and the related instructions for the CNC:

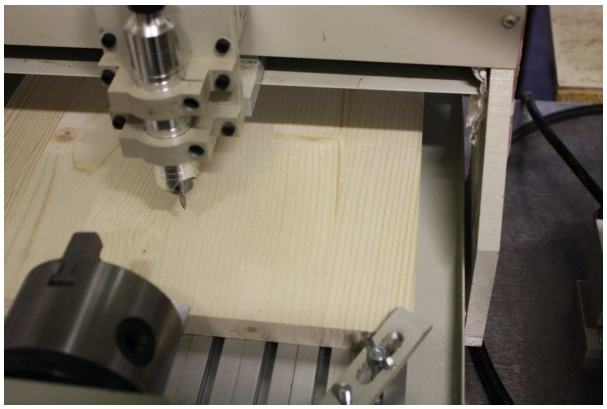


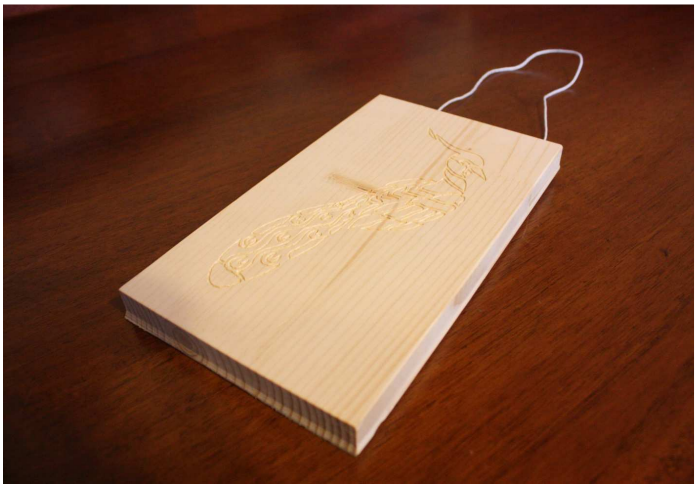
In the G-Code file you will find 101069 lines.

The processing:





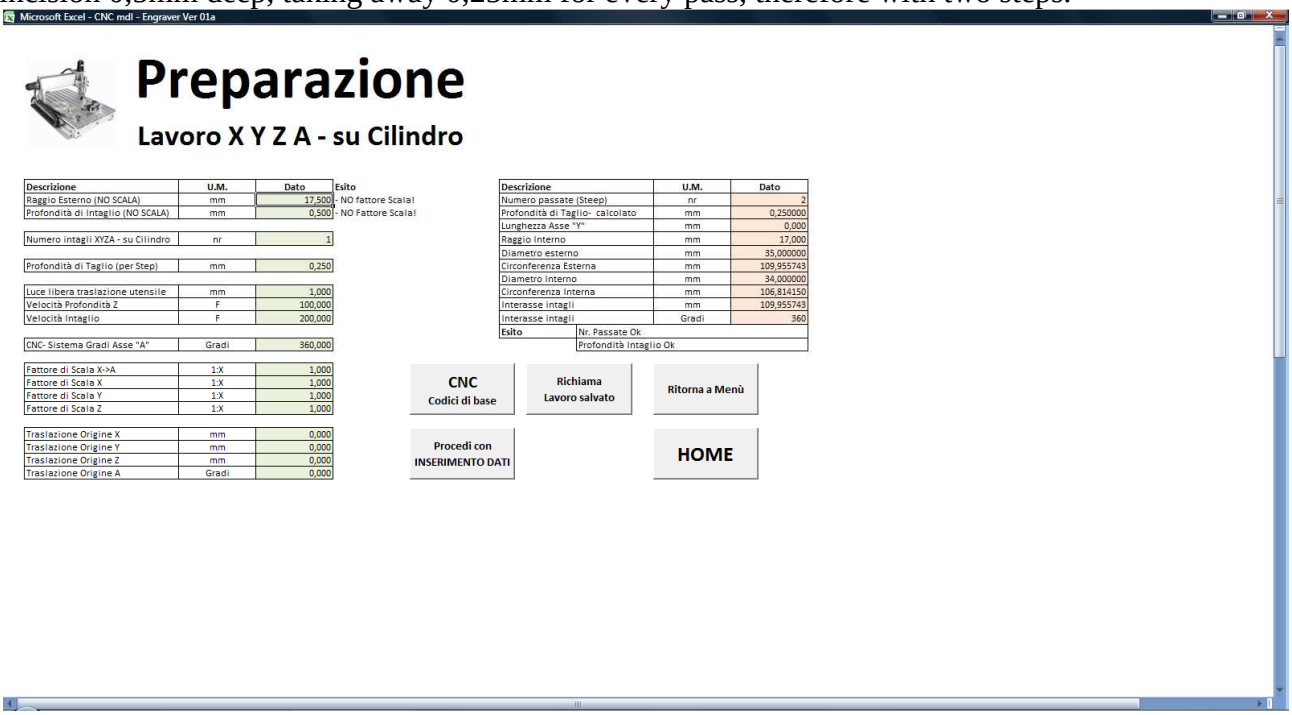




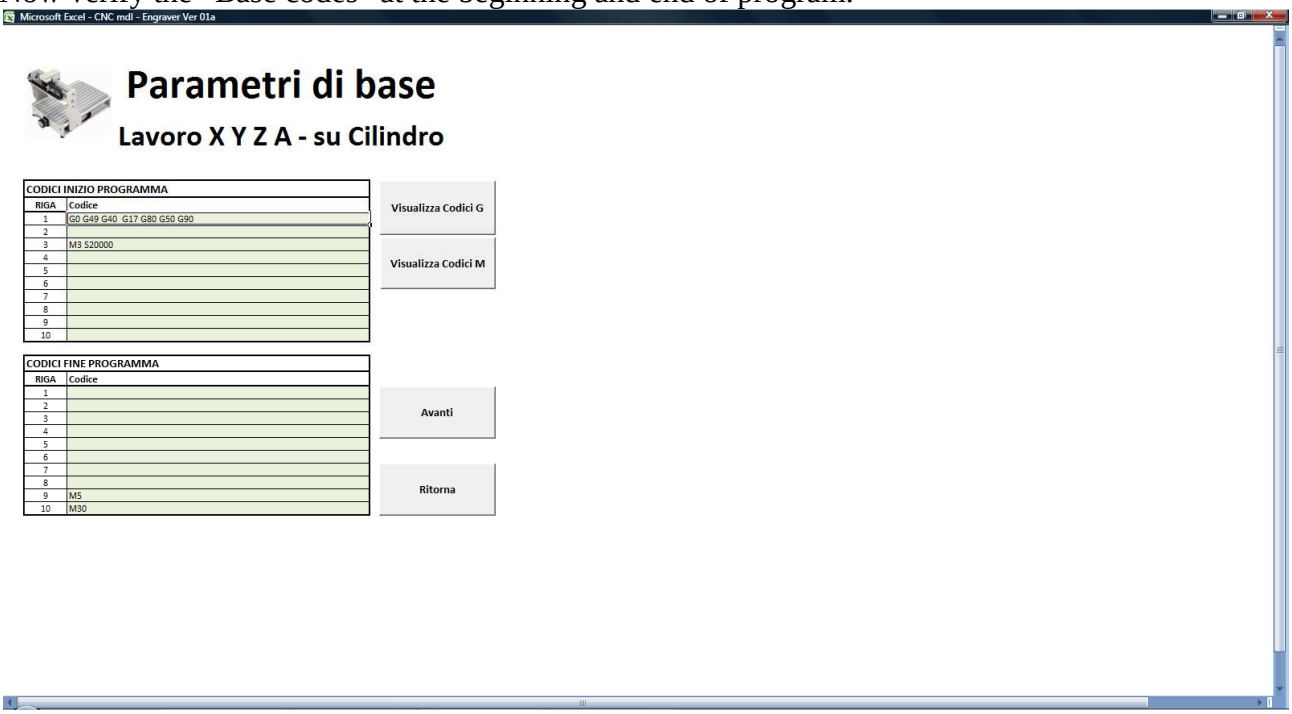
Preparation of the G-Code file – Cylindrical Incision (4 axes)

2) **Incision on a cylindrical surface.**

Insert the basic data and check them all carefully:
in this case we decided to use a cylindrical stick with a diameter of 35mm and to perform an incision 0,5mm deep, taking away 0,25mm for every pass, therefore with two steps.

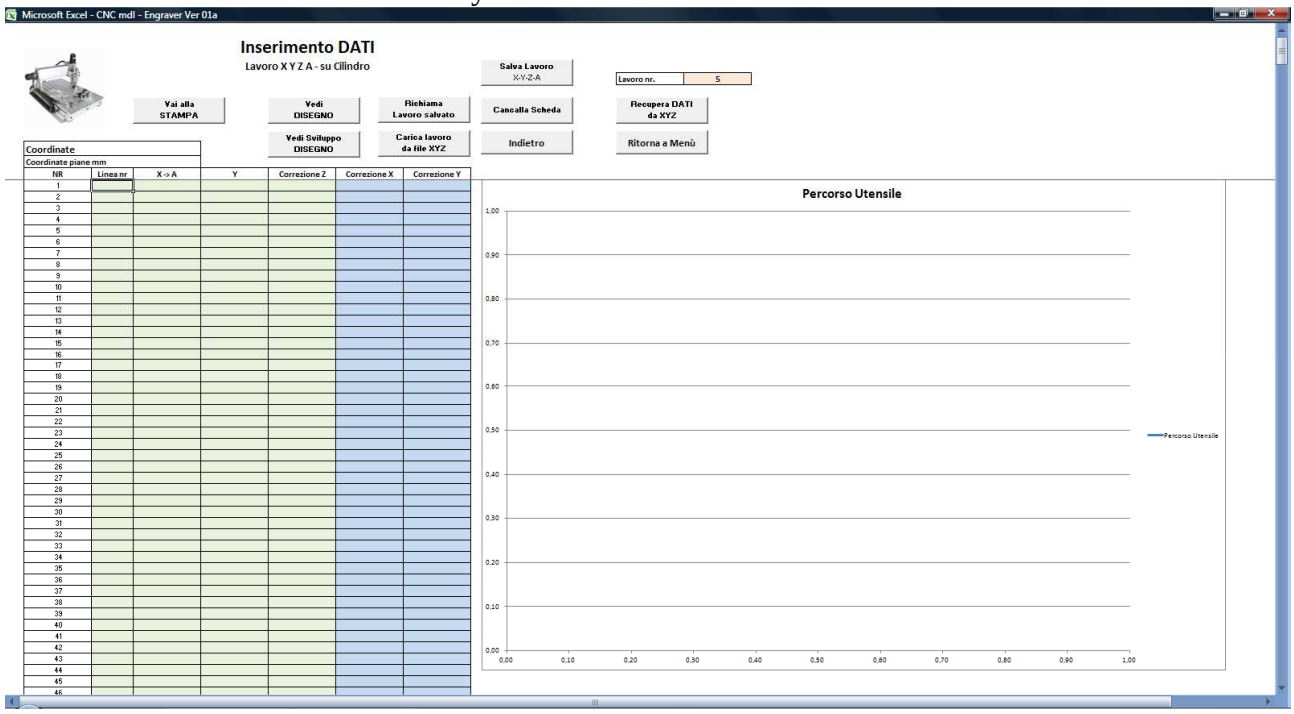


Now verify the “Base codes” at the beginning and end of program.

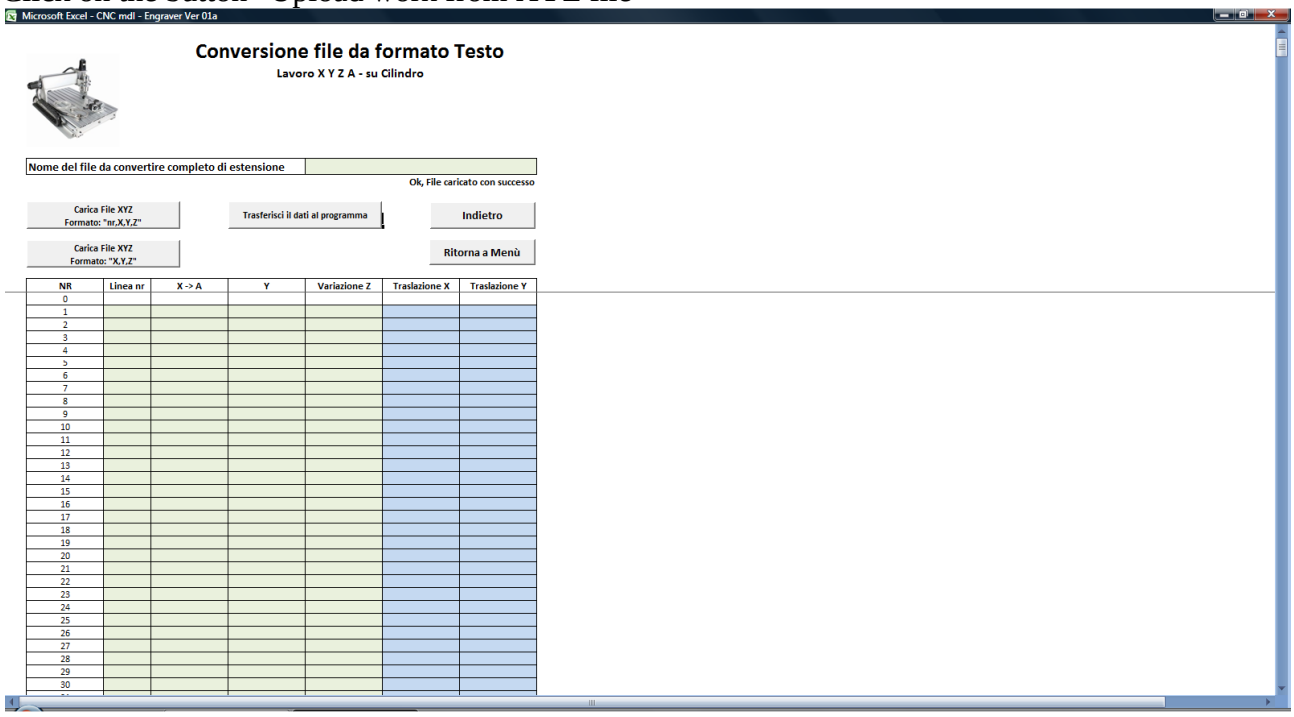


Done this let’s go ahead.

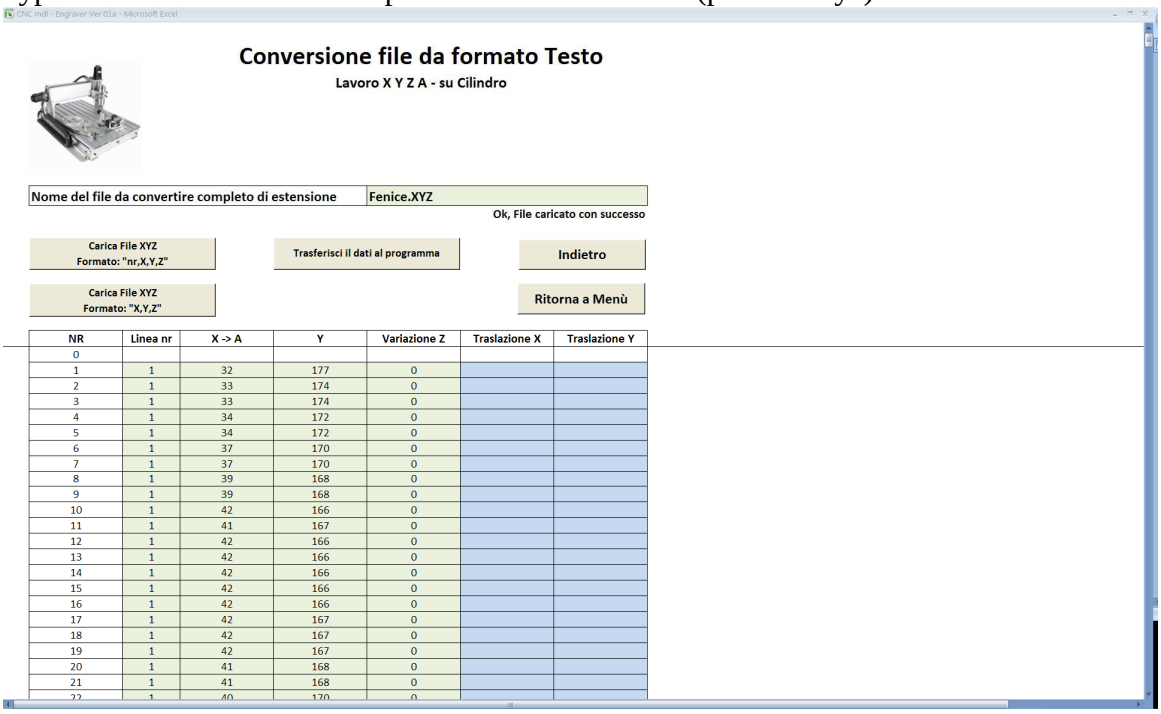
We are now in the screen “Data Entry”



Click on the button “Upload work from XYZ file”



Type the name of the file complete with his extension (phoenix.xyz) and confirm with “enter”.



Conversione file da formato Testo

Lavoro X Y Z A - su Cilindro

Nome del file da convertire completo di estensione	Fenice.XYZ

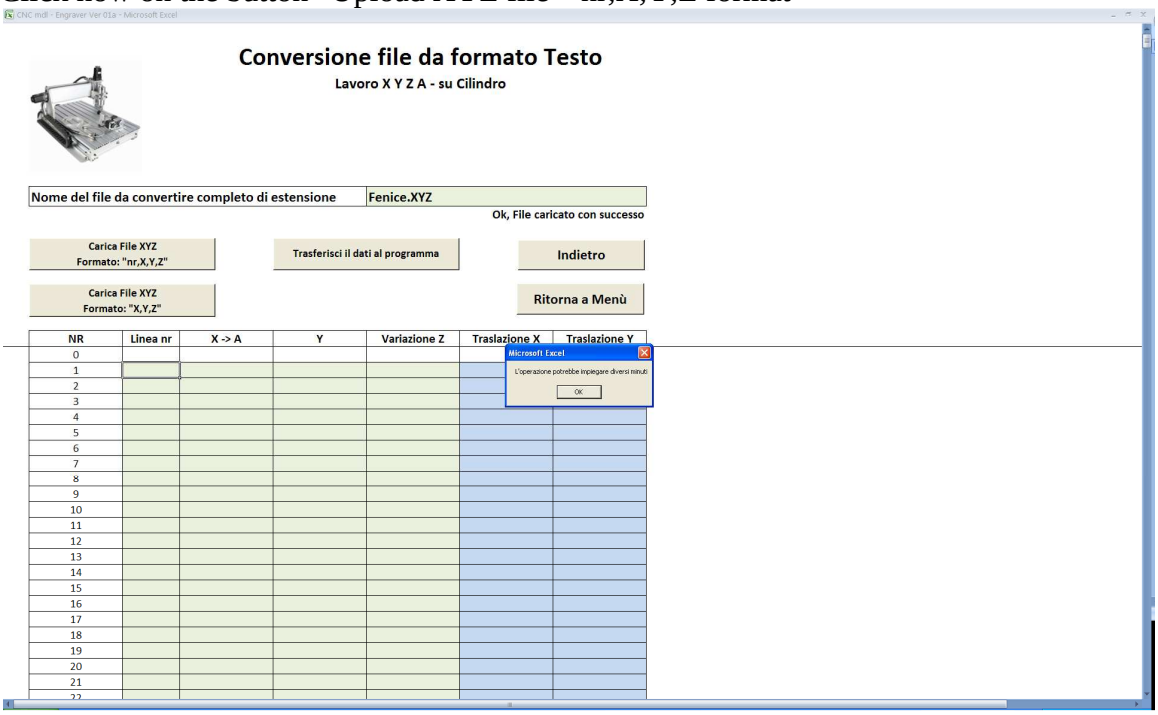
Ok, File caricato con successo

Carica File XYZ Formato: "nr,X,Y,Z" | Trasferisci il dati al programma | Indietro

Carica File XYZ Formato: "X,Y,Z" | Ritorna a Menù

NR	Linea nr	X -> A	Y	Variazione Z	Traslazione X	Traslazione Y
0						
1	1	32	177	0		
2	1	33	174	0		
3	1	33	174	0		
4	1	34	172	0		
5	1	34	172	0		
6	1	37	170	0		
7	1	37	170	0		
8	1	39	168	0		
9	1	39	168	0		
10	1	42	166	0		
11	1	41	167	0		
12	1	42	166	0		
13	1	42	166	0		
14	1	42	166	0		
15	1	42	166	0		
16	1	42	166	0		
17	1	42	167	0		
18	1	42	167	0		
19	1	42	167	0		
20	1	41	168	0		
21	1	41	168	0		
22	1	40	170	0		

Click now on the button “Upload XYZ file – nr,X,Y,Z format”



Conversione file da formato Testo

Lavoro X Y Z A - su Cilindro

Nome del file da convertire completo di estensione	Fenice.XYZ

Ok, File caricato con successo

Carica File XYZ Formato: "nr,X,Y,Z" | Trasferisci il dati al programma | Indietro

Carica File XYZ Formato: "X,Y,Z" | Ritorna a Menù

NR	Linea nr	X -> A	Y	Variazione Z	Traslazione X	Traslazione Y
0						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

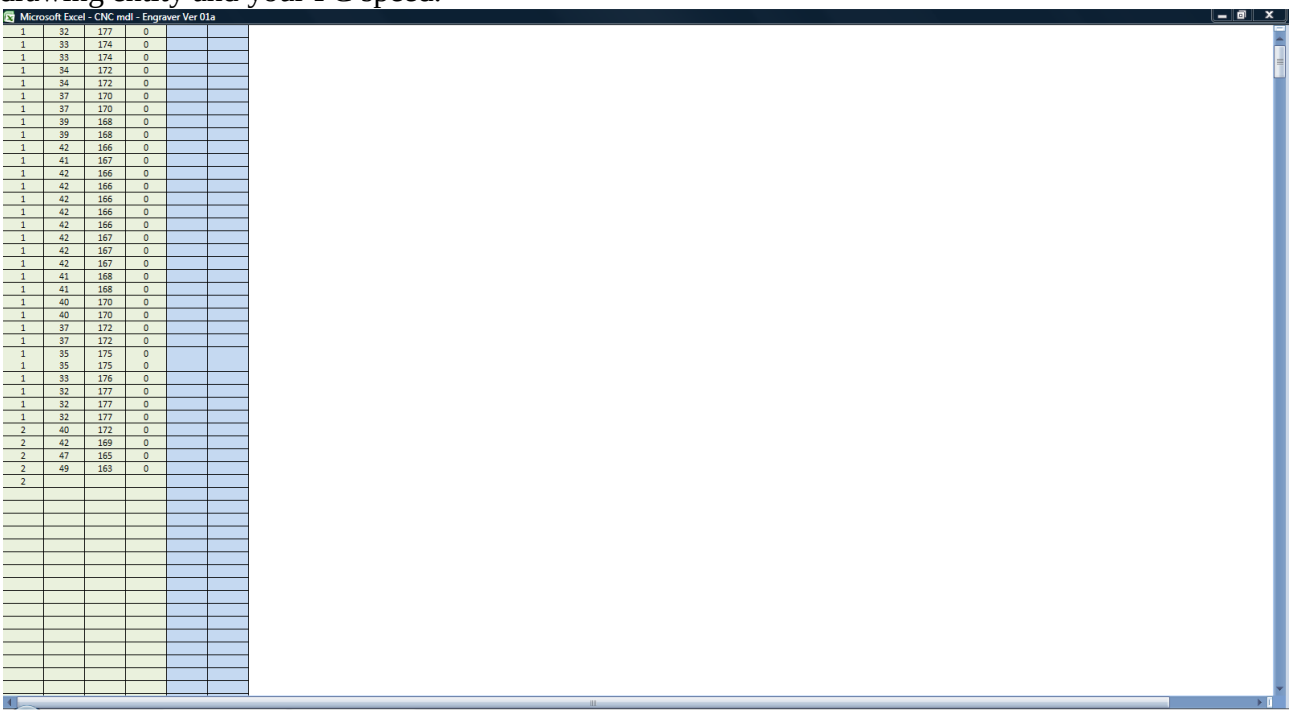
Microsoft Excel

L'operazione potrebbe impiegare diversi minuti

OK

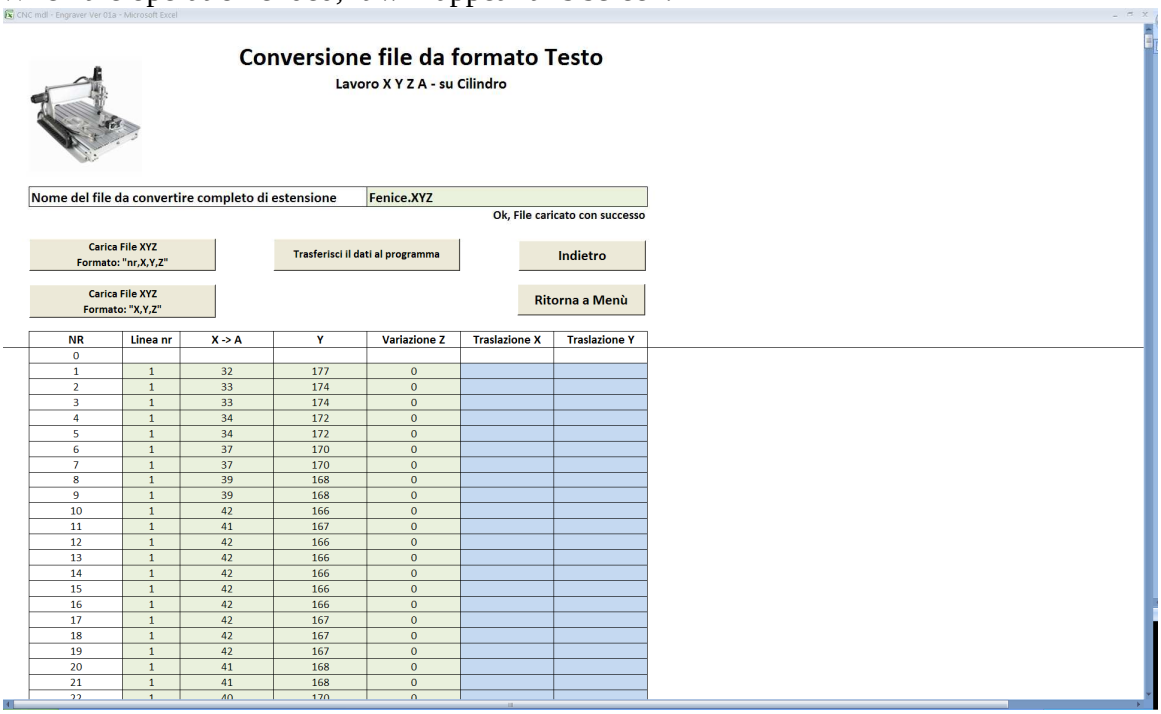
Confirm.

The import screen will appear. Wait until the end of the process. The time needed is related to the drawing entity and your PC speed.



1	32	177	0		
1	33	174	0		
1	33	174	0		
1	34	172	0		
1	34	172	0		
1	37	170	0		
1	37	170	0		
1	39	168	0		
1	39	168	0		
1	42	166	0		
1	41	167	0		
1	42	166	0		
1	42	166	0		
1	42	166	0		
1	42	166	0		
1	42	166	0		
1	42	167	0		
1	42	167	0		
1	42	167	0		
1	41	168	0		
1	41	168	0		
1	40	170	0		
1	40	170	0		
1	37	172	0		
1	37	172	0		
1	35	175	0		
1	35	175	0		
1	33	176	0		
1	32	177	0		
1	32	177	0		
1	32	177	0		
2	40	172	0		
2	42	169	0		
2	47	165	0		
2	49	163	0		
2					

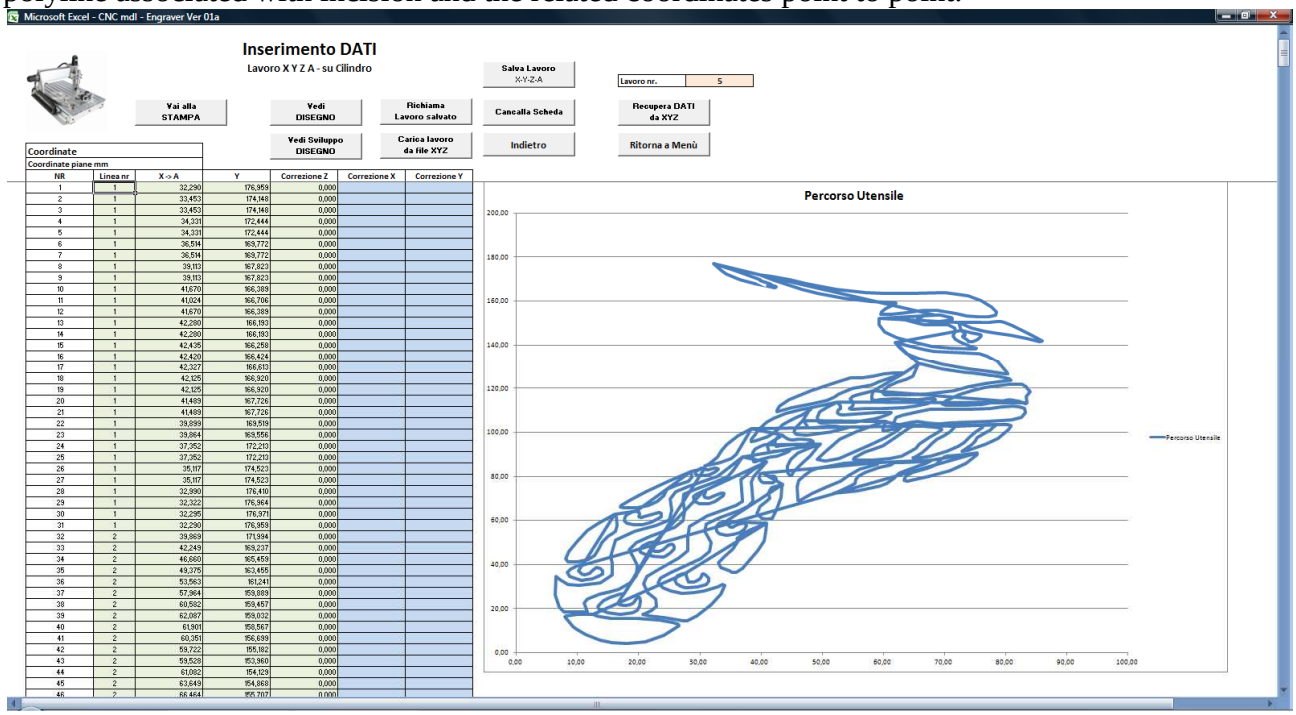
When the operation ended, it will appear this screen:



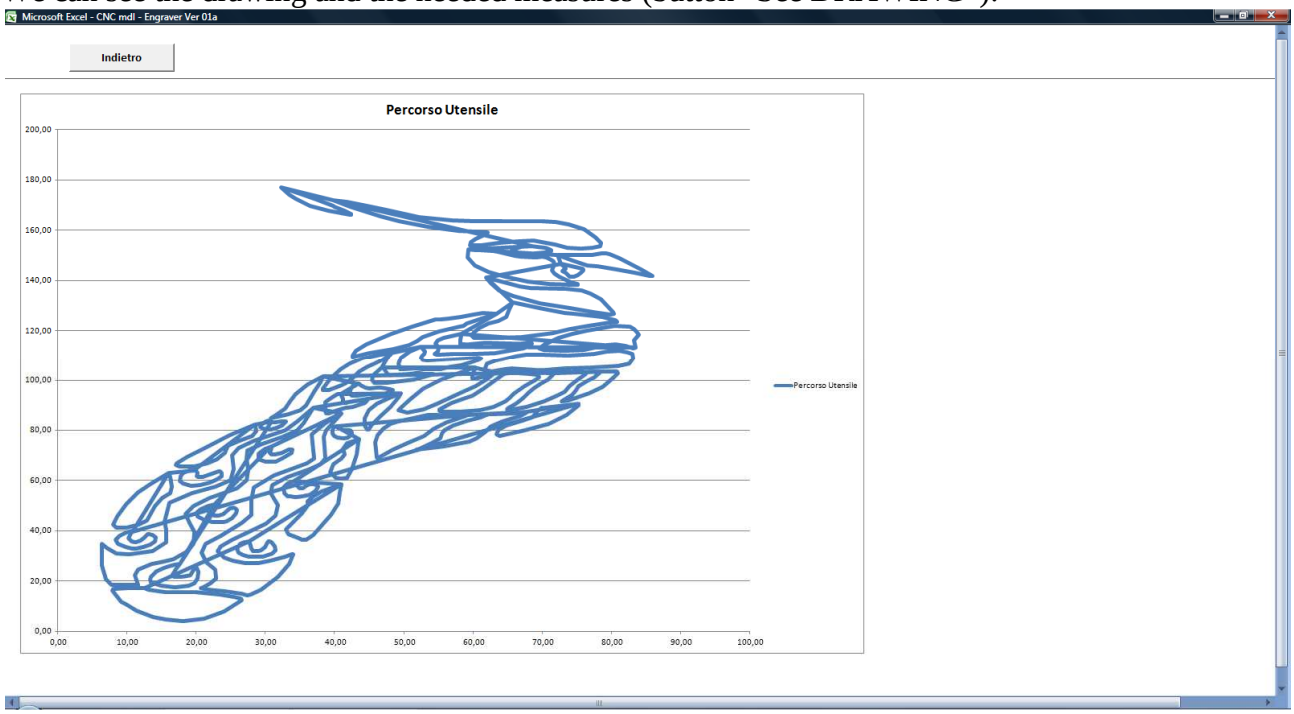
NR	Linea nr	X -> A	Y	Variazione Z	Traslazione X	Traslazione Y
0						
1	1	32	177	0		
2	1	33	174	0		
3	1	33	174	0		
4	1	34	172	0		
5	1	34	172	0		
6	1	37	170	0		
7	1	37	170	0		
8	1	39	168	0		
9	1	39	168	0		
10	1	42	166	0		
11	1	41	167	0		
12	1	42	166	0		
13	1	42	166	0		
14	1	42	166	0		
15	1	42	166	0		
16	1	42	166	0		
17	1	42	167	0		
18	1	42	167	0		
19	1	42	167	0		
20	1	41	168	0		
21	1	41	168	0		
22	1	40	170	0		

Click on “Transfer the data to the program”.

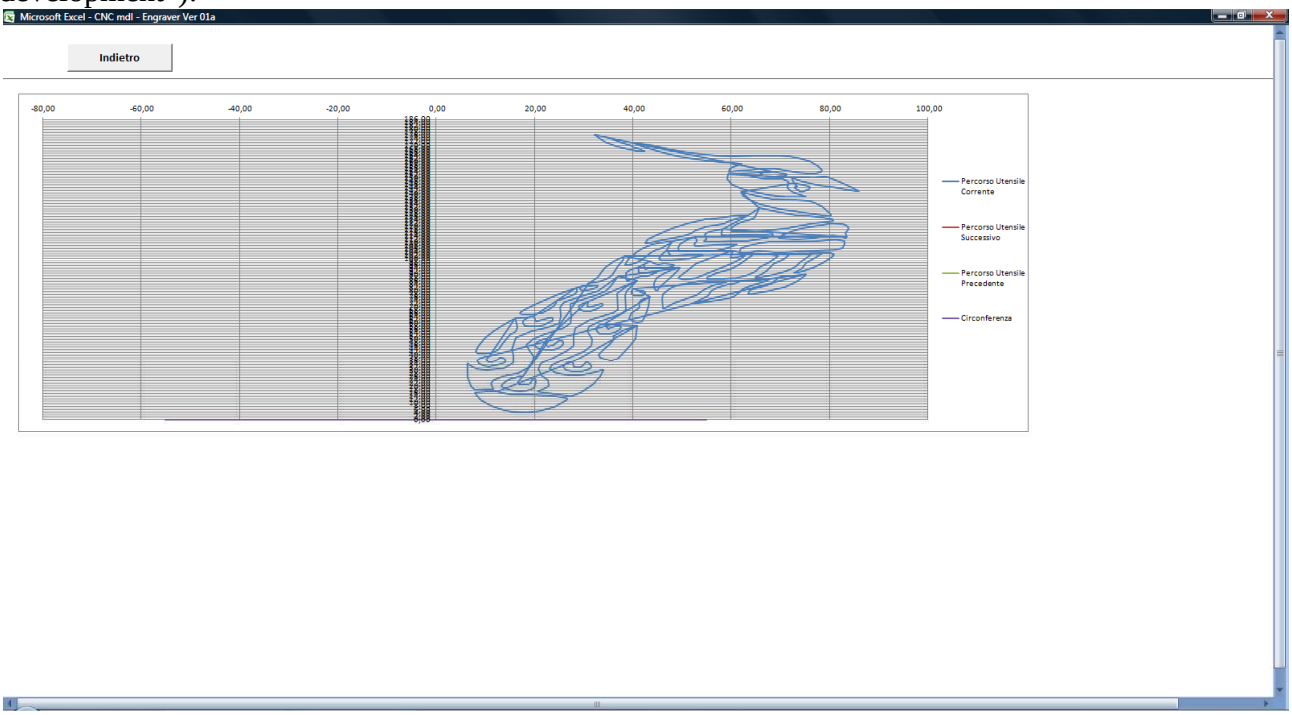
The drawing will be generated automatically; in the columns to the left is the number of the polyline associated with incision and the related coordinates point to point:



We can see the drawing and the needed measures (button “See DRAWING”):



We can also see the drawing development and the measures needed (button “See DRAWING development”):

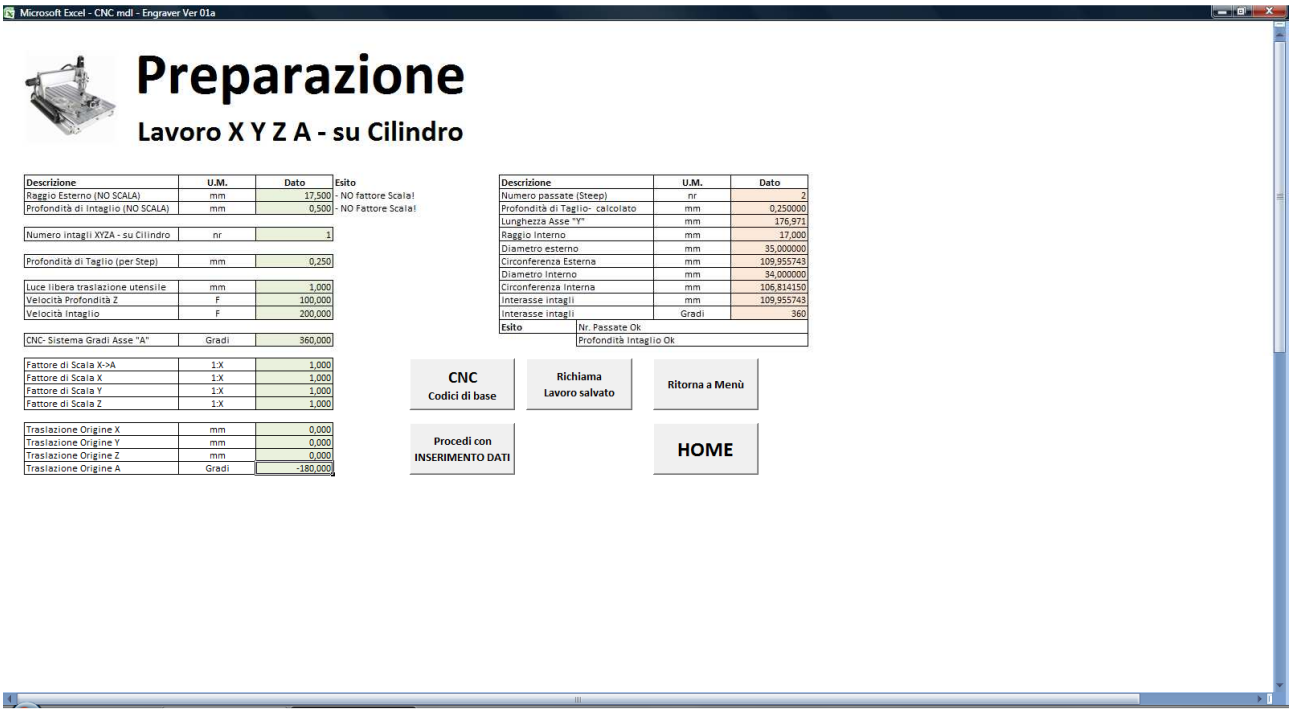


The purple line at bottom (at zero of the “X” axis) reports the linear development of the circumference of the cylinder in the process.

If it is needed to change measures, for example to engrave the “phoenix” on a smaller or bigger surface, it is not required a complicated remaking of the drawing or do complicated operations: you simply return to the specific menu and modify the various “Scale factor”.
We can also translate the incision compared to the zero point of origin.

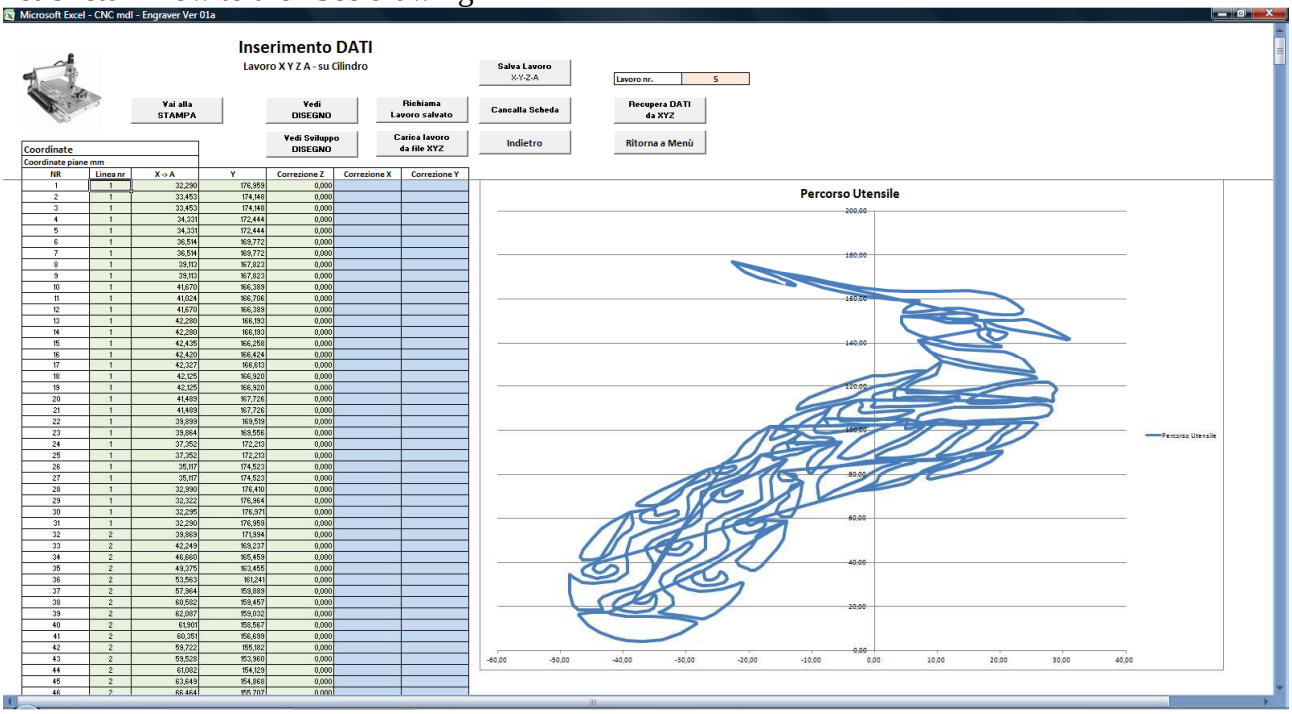
In our case, for instance, we want to “rotate” the incision to move the axis “zero” of the drawing:

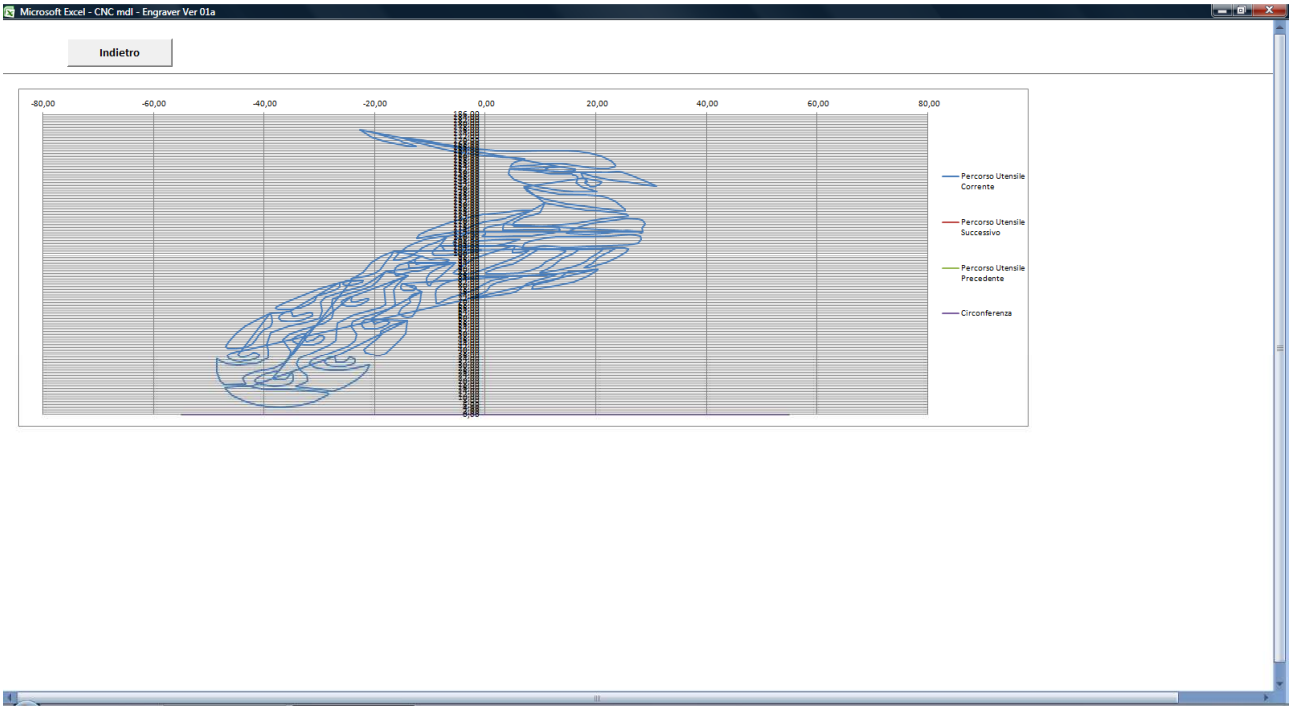
Let’s return to the menu:



Type on “Translation Origin A” the data “-180”: this means that we rotate the origin of the A-axis of 180 degrees (half a lap).

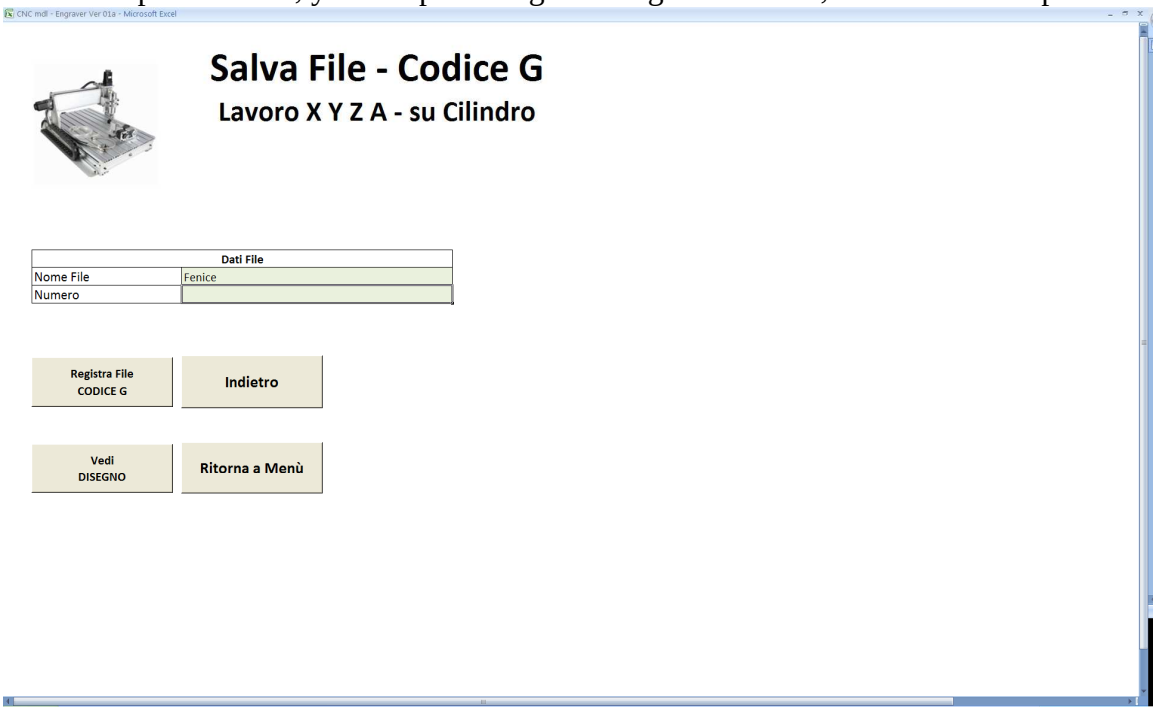
Let’s return now to the “See drawing”



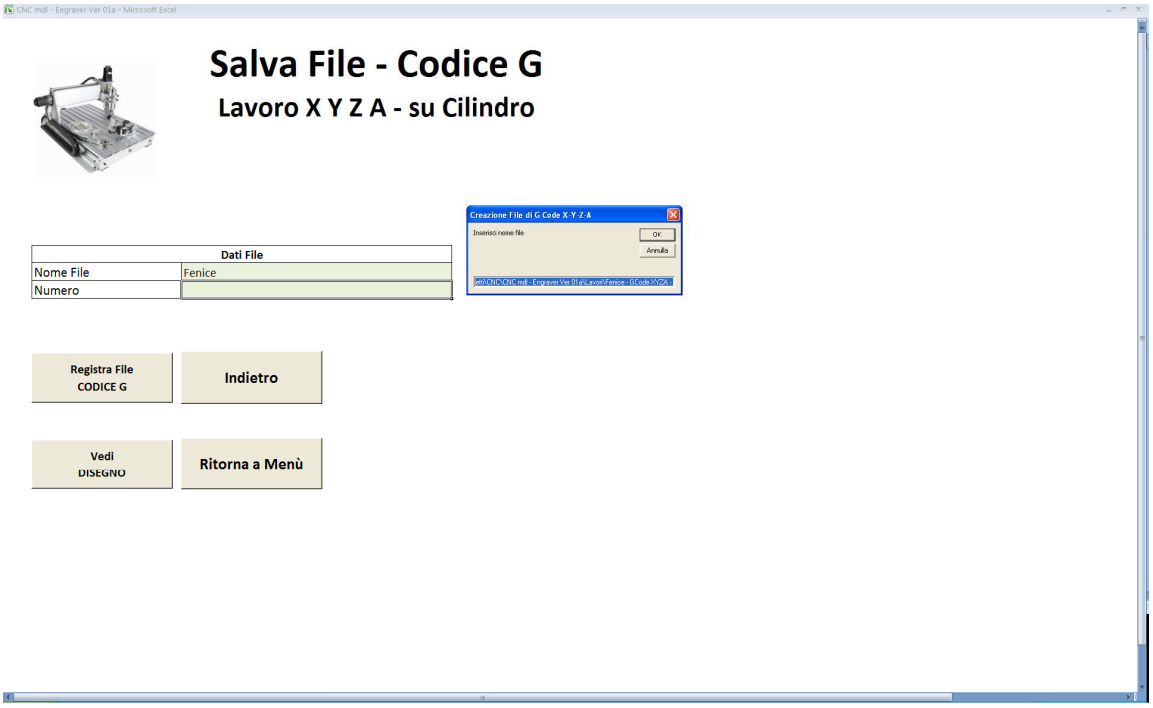


Review the drawing and check the new measures.
We can see that the drawing is rotated compared to the X-axis.
A glance at the purple line of the circumference development allows us to understand that the drawing fits perfectly in the development.

When this phase ended, you can proceed generating the G-Code; click on “Go to print”:

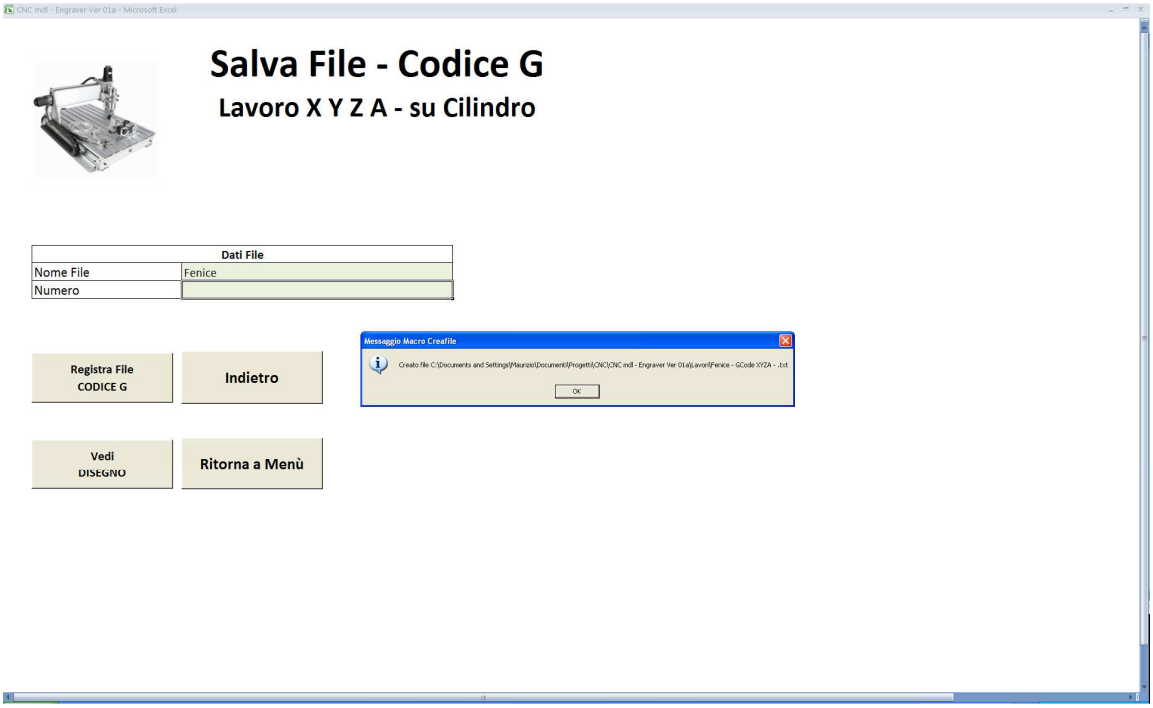


Insert the name of the work.



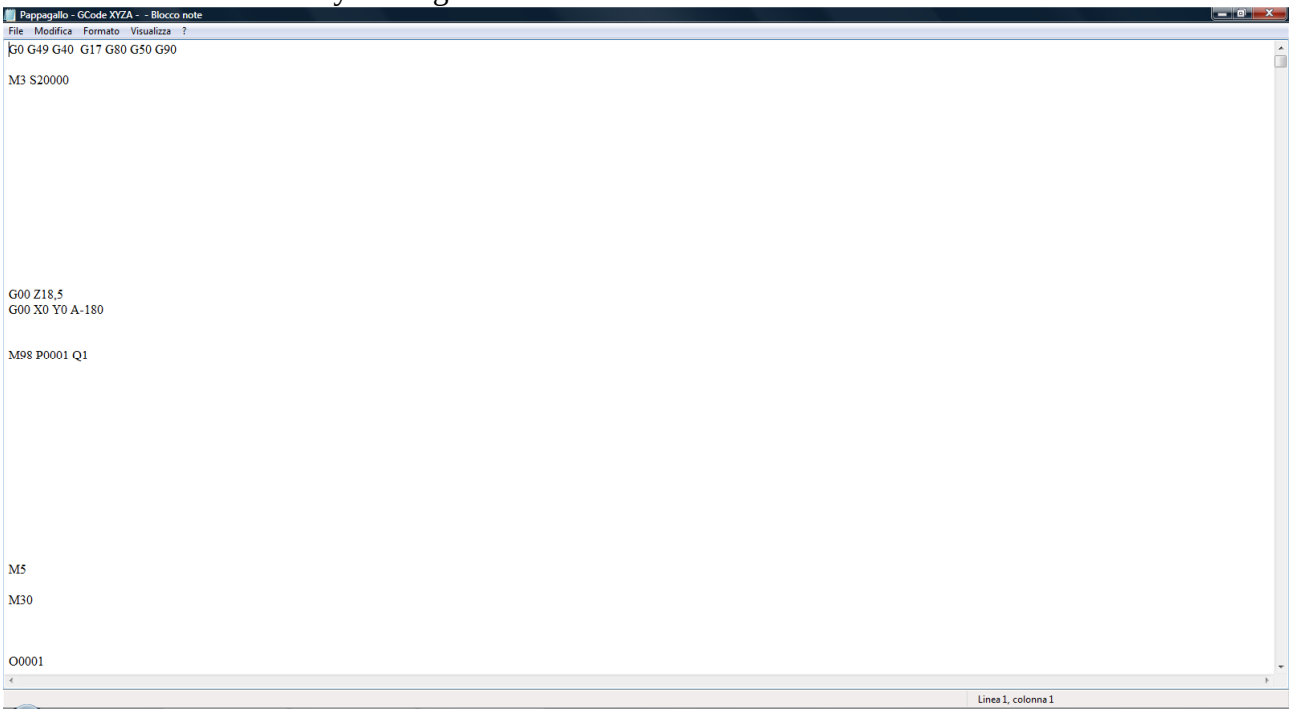
Click on the “Record the G-Code file” button and confirm.

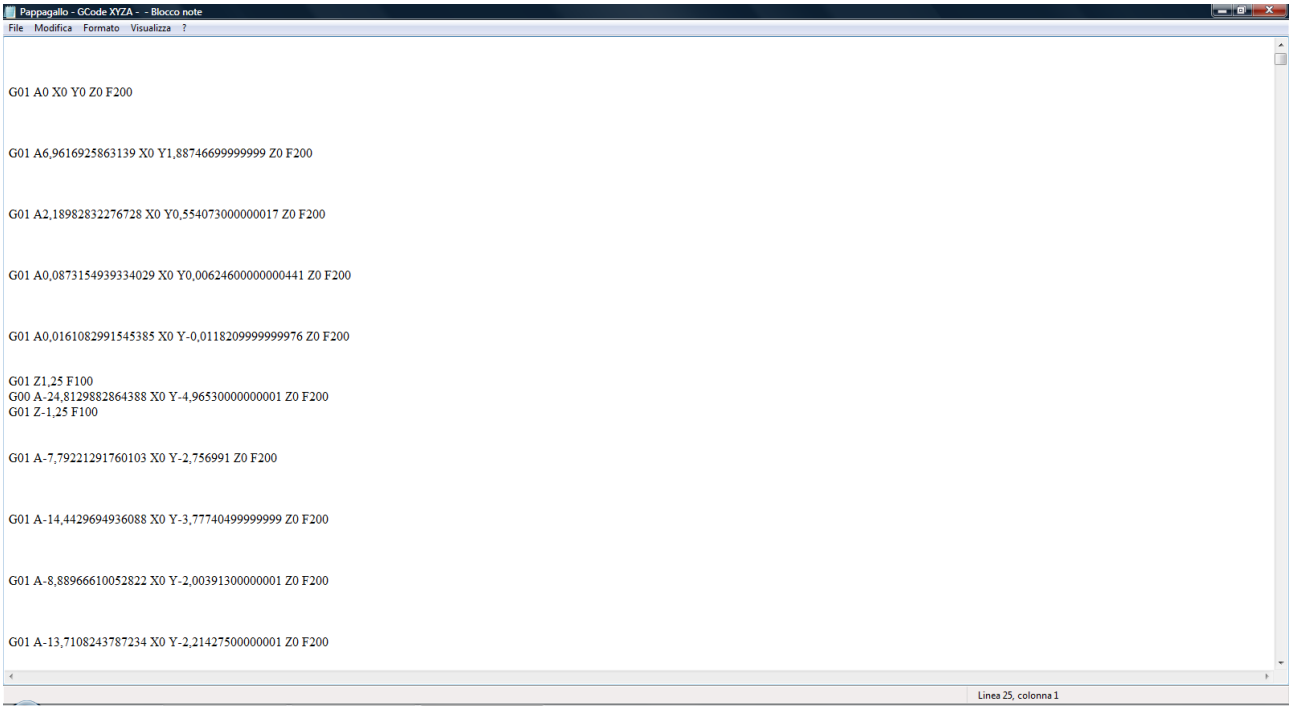
The screen confirms the creation of the file:



The G-Code file is ready and can be transferred to the CNC machine.

For more details let’s analyze the generated G-Code file and the related instructions for the CNC:





In the G-Code file you will find 101069 lines.

The processing:

Good work and, most of all, enjoy!
Maurizio De Luca.

Notes: